

DSP 2x400 PSX

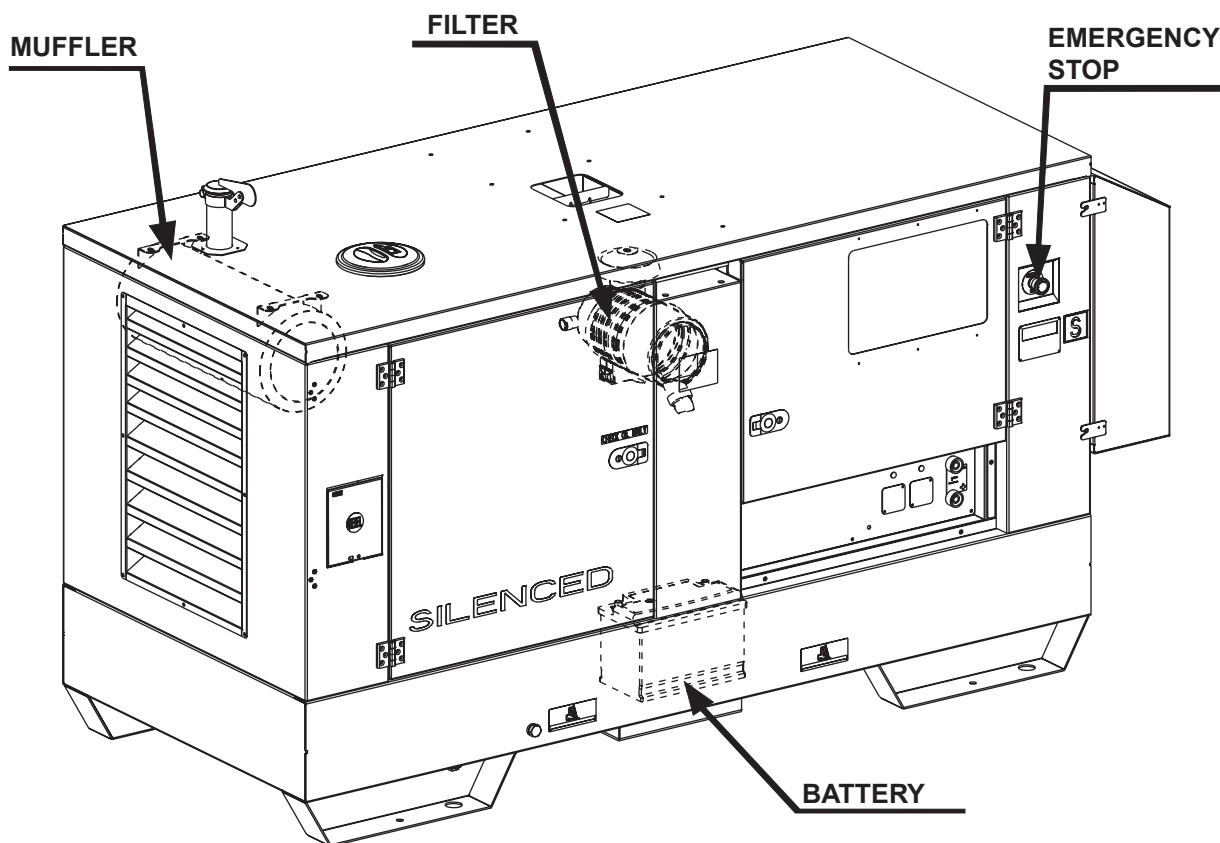
0 2 1 1

884129003 - GB

USE AND MAINTENANCE MANUAL SPARE PARTS CATALOG

Main Characteristics of the unit:

- Control of current with CHOPPER technology at high frequency
- Digital control technique by means of DSP
- Major productivity of 15% in comparison to welders with diode controls and controlled diodes
- 5 Welding processes: TIG contact start, STICK arcforce 1, STICK arcforce 2, STICK arcforce 3, MIGMAG
- Maximum welding current 2x400A
- Polarity change (optional)
- Voltmeter and Ammeter of weld
- 40 kVA of power in three phase generation 400 V / 50 Hz
- Perkins diesel engine 1103C-33TG3 emissioned EURO 2
- Noise level at 7m 64 dBA
- Dimensions / weight: 2490x1030x1480 /1300 Kg



A base assembled to a heavy roll-bar gives solidity to the whole structure.

Accessibility to both engine chamber and electrical box is granted by four doors.

A hinged air inlet box also gives access to the welding chopper units.

Two Plexiglas windows inserted in the front doors allow to check welding parameters and to give access to welding current/voltage control devices.

The maintenance-free battery reduces checks on the state of charge to a minimum.



UNI EN ISO 9001 : 2008

ISO 9001:2008 - Cert. 0192

MOSA has certified its quality system according to UNI EN ISO 9001:2008 to ensure a constant, highquality of its products. This certification covers the design, production and servicing of engine driven welders and generating sets.

The certifying institute, ICIM, which is a member of the International Certification Network IQNet, awarded the official approval to MOSA after an examination of its operations at the head office and plant in Cusago (MI), Italy.

This certification is not a point of arrival but a pledge on the part of the entire company to maintain a level of quality of both its products and services which will continue to satisfy the needs of its clients, as well as to improve the transparency and the communications regarding all the company's activities in accordance with the official procedures and in harmony with the MOSA Manual of Quality.

The advantages for MOSA clients are:

- Constant quality of products and services at the high level which the client expects;
- Continuous efforts to improve the products and their performance at competitive conditions;
- Competent support in the solution of problems;
- Information and training in the correct application and use of the products to assure the security of the operator and protect the environment;
- Regular inspections by ICIM to confirm that the requirements of the company's quality system and ISO 9001 are being respected.

All these advantages are guaranteed by the CERTIFICATE OF QUALITY SYSTEM No.0192 issued by ICIM S.p.A. - Milano (Italy) - www.icim.it

M 01	QUALITY SYSTEM
M 1.01	COPYRIGHT
M 1.1	NOTES
M 1.4	CE MARK
M 1.5	TECHNICAL DATA
M 1.6	WELDING TECHNICAL DATA
M 2	SYMBOLS AND SAFETY PRECAUTIONS
M 2.5 -....	INSTALLATION AND ADVICE BEFORE USE
M 2.6	INSTALLATION AND ADVICE
M 3	UNPACKING
M 4.2	TRANSPORT AND DISPLACEMENTS COVERED UNITS
M 6.8	ASSEMBLY CTL
M 20....	PREPARING THE UNIT
M 21	START-UP
M 22	SHUTTING DOWN THE MOTOR
M 31	CONTROLS
M 32	USE AS A WELDER
M 33...	WELDER DSP (USE)
M 37	USING THE GENERATOR
M 38.9	REMOTE CONTROL
M 40.1	TROUBLESHOOTING
M 43...	MAINTENANCE
M 45	STORAGE
M 46	CUST OFF
M 55	RECOMMENDED ELECTRODES
M 60	ELECTRICAL SYSTEM LEGENDE
M 61-.....	ELECTRICAL SYSTEM
ED...	SPARE PARTS



ATTENTION

This use and maintenance manual is an important part of the machines in question.

The assistance and maintenance personnel must keep said manual at disposal, as well as that for the engine and alternator (if the machine is synchronous) and all other documentation about the machine.

We advise you to pay attention to the pages concerning the security (see page M1.1).



© All rights are reserved to said Company.

It is a property logo of MOSA division of B.C.S. S.p.A. All other possible logos contained in the documentation are registered by the respective owners.

■ The reproduction and total or partial use, in any form and/or with any means, of the documentation is allowed to nobody without a written permission by MOSA division of B.C.S. S.p.A.

To this aim is reminded the protection of the author's right and the rights connected to the creation and design for communication, as provided by the laws in force in the matter.

In no case MOSA division of B.C.S. S.p.A. will be held responsible for any damage, direct or indirect, in relation with the use of the given information.

MOSA division of B.C.S. S.p.A. does not take any responsibility about the shown information on firms or individuals, but keeps the right to refuse services or information publication which it judges discutible, unright or illegal.

INFORMATION

Dear Customer,
We wish to thank you for having bought from MOSA a high quality set.

Our sections for Technical Service and Spare Parts will work at best to help you if it were necessary.

To this purpose we advise you, for all control and overhaul operations, to turn to the nearest authorized Service Centre, where you will obtain a prompt and specialized intervention.

☞ In case you do not profit on these Services and some parts are replaced, please ask and be sure that are used exclusively original MOSA parts; this to guarantee that the performances and the initial safety prescribed by the norms in force are re-established.

☞ **The use of non original spare parts will cancel immediately any guarantee and Technical Service obligation from MOSA.**

NOTES ABOUT THE MANUAL

Before actioning the machine please read this manual attentively. Follow the instructions contained in it, in this way you will avoid inconveniences due to negligence, mistakes or incorrect maintenance. The manual is for qualified personnel, who knows the rules: about safety and health, installation and use of sets movable as well as fixed.

You must remember that, in case you have difficulties for use or installation or others, our Technical Service is always at your disposal for explanations or interventions.

The manual for Use Maintenance and Spare Parts is an integrant part of the product. It must be kept with care during all the life of the product.

In case the machine and/or the set should be yielded to another user, this manual must also given to him.

Do not damage it, do not take parts away, do not tear pages and keep it in places protected from dampness and heat.

You must take into account that some figures contained in it want only to identify the described parts and therefore might not correspond to the machine in your possession.

INFORMATION OF GENERAL TYPE

In the envelope given together with the machine and/or set you will find: the manual for Use Maintenance and Spare Parts, the manual for use of the engine and the tools (if included in the equipment), the guarantee (in the countries where it is prescribed by law).

Our products have been designed for the use of generation for welding, electric and hydraulic system; ANY OTHER DIFFERENT USE NOT INCLUDED IN THE ONE INDICATED, relieves MOSA from the risks which could happen or, anyway, from that which was agreed when selling the machine; MOSA excludes any responsibility for damages to the machine, to the things or to persons in this case.

Our products are made in conformity with the safety norms in force, for which it is advisable to use all these devices or information so that the use does not bring damage to persons or things.

While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing by MOSA: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

☞ **Notice:** *this manual does not engage MOSA, who keeps the faculty, apart the essential characteristics of the model here described and illustrated, to bring betterments and modifications to parts and accessories, without putting this manual uptodate immediately.*



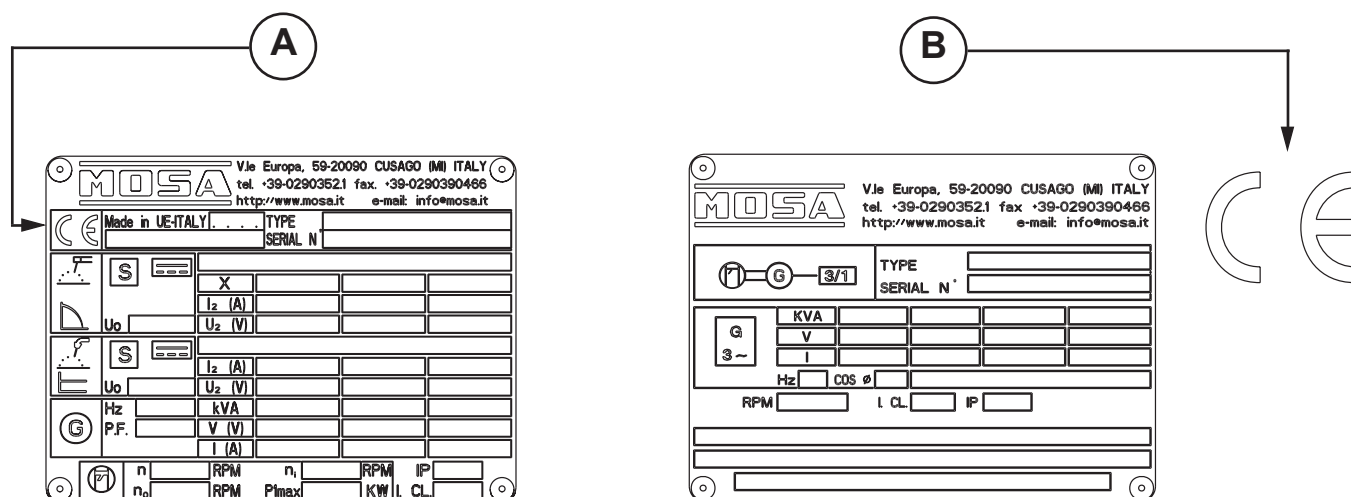
Any of our product is labelled with CE marking attesting its conformity to applicable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.

Here below the adopted symbol:

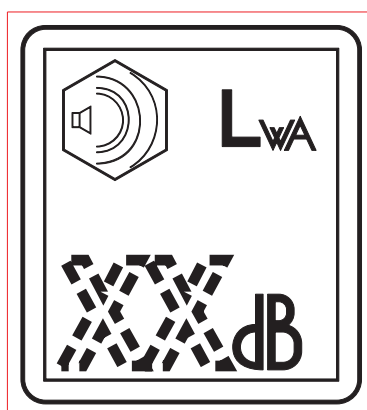
CE marking is clearly readable and unerasable and it can be either part of the data-plate (A) or



placed as a sticker near the data-plate (B)



Furthermore, on each model it is shown the noise level value; the symbol used is the following:



The indication is shown in a clear, readable and indeleble way on a sticker.

BCS S.p.A.Sede legale:
Via Marradi 1
20123 Milano - Italia**Stabilimento di Cusago, 20090 (MI) - Italia**V.le Europa 59
Tel.: +39 02 903521
Fax: +39 02 90390466

ISO 9001:2000 - Cert. 0192

DICHIARAZIONE DI CONFORMITA'Déclaration de Conformité – Declaration of Conformity – Konformitätserklärung
Conformiteitsverklaring – Declaración de Conformidad

BCS S.p.A. dichiara sotto la propria responsabilità che la macchina:
BCS S.p.A. déclare, sous sa propre responsabilité, que la machine:
BCS S.p.A. declares, under its own responsibility, that the machine:
BCS S.p.A. erklärt, daß die Aggregate:
BCS S.p.A. verklaard, onder haar eigen verantwoordelijkheid, dat de machine:
BCS S.p.A. declara bajo su responsabilidad que la máquina:

GRUPPO ELETTROGENO DI SALDATURA / WELDING GENERATOR ☐GRUPPO ELETTROGENO / POWER GENERATOR ☐

Marchio / Brand : MOSA

Modello / Model :

Matricola / Serial number :

è conforme con quanto previsto dalle Direttive Comunitarie e relative modifiche:
est en conformité avec ce qui est prévu par les Directives Communautaires et relatives modifications:
conforms with the Community Directives and related modifications:
mit den Vorschriften der Gemeinschaft und deren Ergänzungen übereinstimmt:
in overeenkomst is met de inhoud van gemeenschapsrichtlijnen gerelateerde modificaties:
comple con los requisitos de la Directiva Comunitaria y sus anexos:

2006/42/CE - 2006/95/CE - 2004/108/CE

Nome e indirizzo della persona autorizzata a costituire il fascicolo tecnico :
Nom et adresse de la personne autorisée à composer le Dossier Technique :
Person authorized to compile the technical file and address :
Name and Adresse der zur Ausfüllung der technischen Akten ermächtigten Person :
Persoon bevoegd om het technische document , en bedrijf gegevens in te vullen
Nombre y dirección de la persona autorizada a componer el expediente técnico :

Ing. Benso Marelli - Amministratore Delegato / CEO; V.le Europa 59, 20090 Cusago (MI) - Italy

Cusago,

Ing. Benso Marelli
Amministratore Delegato
CEO

The DSP 2x400 engine driven welder is a unit which ensures the function as:

- a) a current source for arc welding
- b) a current source for the auxiliary power generation

It is meant for industrial and professional use, powered by an endothermic engine; it is composed of various main parts such as: engine, alternator, electric and electronic controls, the fairing or a protective structure.

The assembling is made on a steel structure, on which are provided elastic support which must damp the vibrations and also eliminate sounds which would produce noise.

Technical data

DSP 2x400 PSX

GENERATOR

Output three-phase	40 kVA / 400 V / 57.8 A
Output single-phase	20 kVA / 230 V / 87 A
Output single-phase	5 kVA / 48 V / 104 A
Frequency	50 Hz
Cos φ	0.8

ALTERNATOR

	Self-excited, self-regulated, brushless
Type	three-phase, asynchronous
Insulating class	H

ENGINE

Mark / Model	PERKINS / 1103C-33TG3
Type / Cooling system	Diesel 4-Stroke / water
Cylinders / Displacement	3 / 3300 cm ³
Net output	45.6 kW (62 HP)
Speed	1500 rpm
Fuel consumption (welding 60%)	6.7 l/h
Cooling system capacity	10.2 l
Engine oil capacity	7.9 l
Starter	Electric

GENERAL SPECIFICATIONS

Battery	12V - 100Ah
Tank capacity	102 l
Running time (welding 60%)	15 h
Protection	IP 44
Dimensions Lxwxh (mm) *	2490x1030x1480
Weight *	1300 Kg

Measured acoustic power LwA (pressure LpA) 89 dB(A) (64 dB(A) @ 7 m)

Guaranteed acoustic power LwA (pressure LpA) 90 dB(A) (65 dB(A) @ 7 m)



* Dimensions and weight are inclusive of all parts without wheels and towbar.

POWER

Declared power according to ISO 3046-1 (temperature 25°C, 30% relative humidity, altitude 100 m above sea level).

It's admitted overload of 10% each hour every 12 h.

In an approximative way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.

ACOUSTIC POWER LEVEL

ATTENTION: The concrete risk due to the machine depends on the conditions in which it is used. Therefore, it is up to the end-user and under his direct responsibility to make a correct evaluation of the same risk and to adopt specific precautions (for instance, adopting a I.P.D. -Individual Protection Device)

Acoustic Noise Level (LWA) - Measure Unit dB(A): it stands for acoustic noise released in a certain delay of time. This is not submitted to the distance of measurement.

Acoustic Pressure (Lp) - Measure Unit dB(A): it measures the pressure originated by sound waves emission. Its value changes in proportion to the distance of measurement.

The here below table shows examples of acoustic pressure (Lp) at different distances from a machine with Acoustic Noise Level (LWA) of 95 dB(A)

Lp a 1 meter = 95 dB(A) - 8 dB(A) = 87 dB(A)

Lp a 7 meters = 95 dB(A) - 25 dB(A) = 70 dB(A)

Lp a 4 meters = 95 dB(A) - 20 dB(A) = 75 dB(A)

Lp a 10 meters = 95 dB(A) - 28 dB(A) = 67 dB(A)

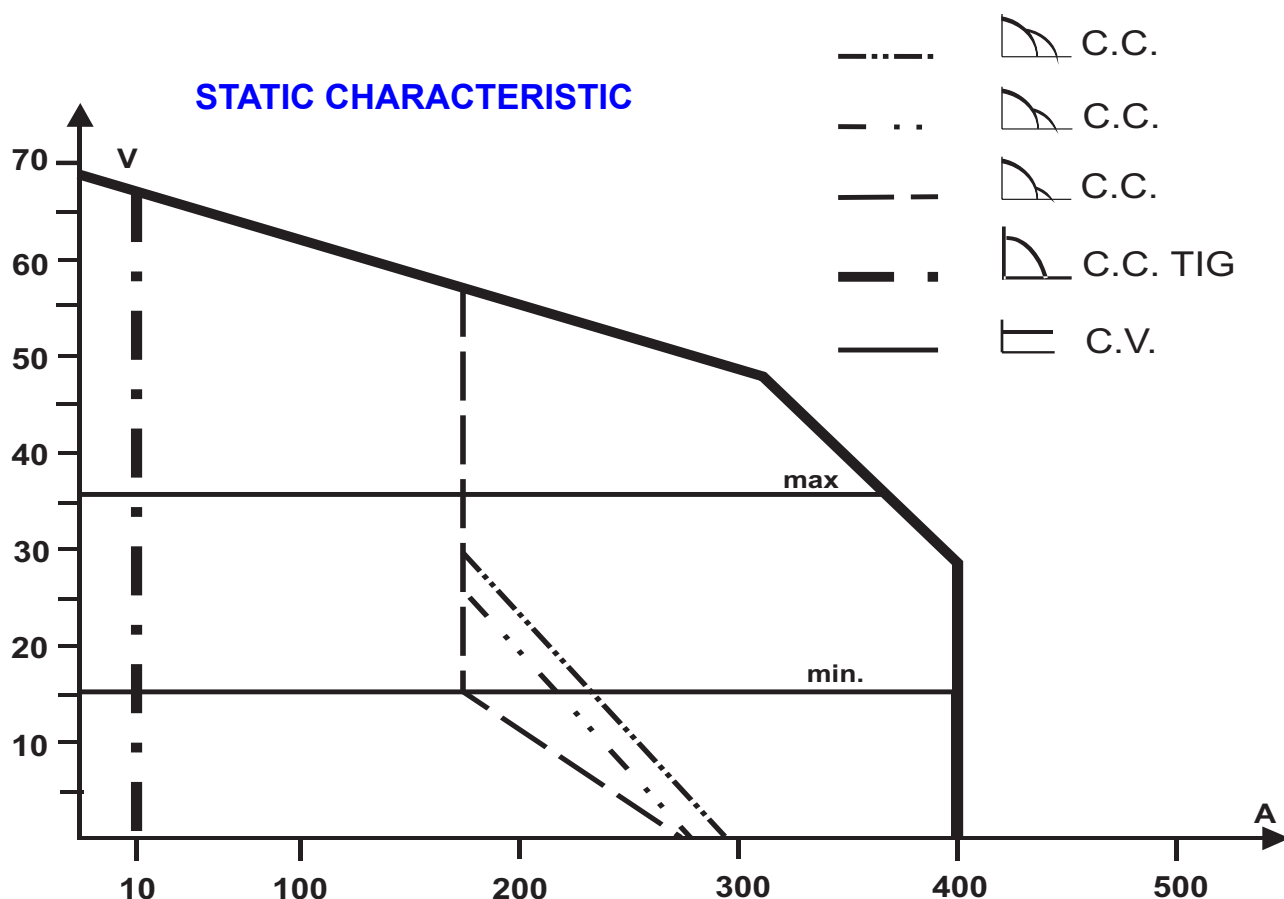
PLEASE NOTE: the symbol when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

C.C. WELDING

Welding current 2x400A/35% - 2x360A/60% - 2x330A/100%
 Starting voltage 68V

C.V. WELDING

Welding current 2x360A/60% - 2x330A/100%
 Welding voltage 16 - 36V


SIMULTANEOUS UTILIZATION FACTORS

In case **Welding** and **Generation** can be used simultaneously, however, the engine cannot be overloaded. The table below gives the maximum limits to be respected:

WELDING CURRENT SINGLE POSITION	400A	300A	200A	100A	0
AUXILIARY POWER	25kVA	30kVA	35 kVA	40 kVA	40 kVA

WELDING CURRENT DOUBLE POSITION	2x400A	2x300A	2x200A	2x100A	0
AUXILIARY POWER	10kVA	20 kVA	30 kVA	40 kVA	40 kVA

SYMBOLS IN THIS MANUAL

- The symbols used in this manual are designed to call your attention to important aspects of the operation of the machine as well as potential hazards and dangers for persons and things.

IMPORTANT ADVICE

- Advice to the User about the safety:

N.B.: The information contained in the manual can be changed without notice. Potential damages caused in relation to the use of these instructions will not be considered because these are only indicative. Remember that the non observance of the indications reported by us might cause damage to persons or things. It is understood, that local dispositions and/or laws must be respected.

WARNING



Situations of danger - no harm to persons or things

Do not use without protective devices provided

Removing or disabling protective devices on the machine is prohibited.

Do not use the machine if it is not in good technical condition

The machine must be in good working order before being used. Defects, especially those which regard the safety of the machine, must be repaired before using the machine.

SAFETY PRECAUTIONS



DANGEROUS

This heading warns of an immediate danger for persons as well for things. Not following the advice can result in serious injury or death.



WARNING

This heading warns of situations which could result in injury for persons or damage to things.



CAUTION

To this advice can appear a danger for persons as well as for things, for which can appear situations bringing material damage to things.



IMPORTANT



NOTE



ATTENTION

These headings refer to information which will assist you in the correct use of the machine and/or accessories.

SYMBOLS



STOP - Read absolutely and be duly attentive



Read and pay due attention



GENERAL ADVICE - If the advice is not respected damage can happen to persons or things.



HIGH VOLTAGE - Attention High Voltage. There can be parts in voltage, dangerous to touch. The non observance of the advice implies life danger.



FIRE - Danger of flame or fire. If the advice is not respected fires can happen.



HEAT - Hot surfaces. If the advice is not respected burns or damage to things can be caused.



EXPLOSION - Explosive material or danger of explosion. in general. If the advice is not respected there can be explosions.



WATER - Danger of shortcircuit. If the advice is not respected fires or damage to persons can be caused.



SMOKING - The cigarette can cause fire or explosion. If the advice is not respected fires or explosions can be caused.



ACIDS - Danger of corrosion. If the advice is not respected the acids can cause corrosions with damage to persons or things.



WRENCH - Use of the tools. If the advice is not respected damage can be caused to things and even to persons.



PRESSION - Danger of burns caused by the expulsion of hot liquids under pressure.



ACCES FORBIDDEN to non authorizad people.

PROHIBITIONS No harm for persons

Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

Use only with safety protections -



It is a must to use protection means suitable for the different welding works.

Use with only safety material -



It is prohibited to use water to quench fires on the electric machines.

Use only with non inserted voltage -



It is prohibited to make interventions before having disinserted the voltage.

No smoking -



It is prohibited to smoke while filling the tank with fuel.

No welding -



It is forbidden to weld in rooms containing explosive gases.

ADVICE No harm for persons and things

Use only with safety tools, adapted to the specific use -

It is advisable to use tools adapted to the various maintenance works.

Use only with safety protections, specifically suitable



It is advisable to use protections suitable for the different welding works.

Use only with safety protections -



It is advisable to use protections suitable for the different daily checking works.

Use only with safety protections -



It is advisable to use all protections while shifting the machine.

Use only with safety protections -



It is advisable to use protections suitable for the different daily checking works.and/or of maintenance.



The installation and the general advice concerning the operations, are finalized to the correct use of the machine, in the place where it is used as generator group and/or welder.

ENGINE	Stop engine when fueling	CHECKING BOARD	Do not touch electric devices if you are barefoot or with wet clothes.
	Do not smoke, avoid flames, sparks or electric tools when fueling.		
	Unscrew the cap slowly to let out the fuel vapours.		Always keep off leaning surfaces during work operations.
	Slowly unscrew the cooling liquid tap if the liquid must be topped up.		
	The vapor and the heated cooling liquid under pressure can burn face, eyes, skin.		Static electricity can damage the parts on the circuit.
	Do not fill tank completely.		
	Wipe up spilled fuel before starting engine.		An electric shock can kill
	Shut off fuel of tank when moving machine (where it is assembled).		
	Avoid spilling fuel on hot engine.		
	Sparks may cause the explosion of battery vapours		



FIRST AID. In case the operator should be sprayed by accident, from corrosive liquids a/o hot toxic gas or whatever event which may cause serious injuries or death, predispose the first aid in accordance with the ruling labour accident standards or of local instructions.

Skin contact	Wash with water and soap
Eyes contact	Irrigate with plenty of water, if the irritation persists contact a specialist
Ingestion	Do not induce vomit as to avoid the intake of vomit into the lungs, send for a doctor
Suction of liquids from lungs	If you suppose that vomit has entered the lungs (as in case of spontaneous vomit) take the subject to the hospital with the utmost urgency
Inhalation	In case of exposure to high concentration of vapours take immediately to a non polluted zone the person involved



FIRE PREVENTION. In case the working zone, for whatsoever cause goes on fire with flames liable to cause severe wounds or death, follow the first aid as described by the ruling norms or local ones.

EXTINCTION MEANS	
Appropriated	Carbonate anhydride (or carbon dioxide) powder, foam, nebulized water
Not to be used	Avoid the use of water jets
Other indications	Cover eventual shedding not on fire with foam or sand, use water jets to cool off the surfaces close to the fire
Particular protection	Wear an autorespiratory mask when heavy smoke is present
Useful warnings	Avoid, by appropriate means to have oil sprays over metallic hot surfaces or over electric contacts (switches, plugs, etc.). In case of oil sprinkling from pressure circuits, keep in mind that the inflammability point is very low.

WARNING					CAUTION		DANGER

	WARNING	THE MACHINE <u>MUST NOT BE USED</u> IN AREAS WITH EXPLOSIVE ATMOSPHERE
--	----------------	---



INSTALLATION AND ADVICE BEFORE USE

The operator of the welder is responsible for the security of the people who work with the welder and for those in the vicinity.

The security measures must satisfy the rules and regulations for engine driven welders.

The information given below is in addition to the local security norms.

Estimate possible electromagnetic problems in the work area taking into account the following indications.

1. Telephonic wirings and/or of communication, check wirings and so on, in the immediate vicinity.
2. Radio and television receptors and transmettors.
3. Computer and other checking devices.
4. Critical devices for safety and/or for industrial checks.
5. Peapol who, for instance, use pace-maker, hearing-aid for deaf or something and else.
6. Devices used for rating and measuring.
7. The immunity of other devices in the operation area of the welder. Make sure that other used devices are compatible. If it is the case, provide other additional measures of protection.
8. The daily duration of the welding time.



Make sure that the area is safe before starting any welding operation.

- ➡ Do not touch any bare wires, leads or contacts as they may be live and there is danger of electric shock which can cause death or serious burns. The electrode and welding cables, etc. are live when the unit is operating.
- ➡ Do not touch any electrical parts or the electrode while standing in water or with wet hands, feet or clothes.
- ➡ Insulate yourself from the work surface while welding. Use carpets or other insulating materials to avoid physical contact with the work surface and the floor.
- ➡ Always wear dry, insulating gloves, without holes, and body protection.
- ➡ Do not wind cables around the body.
- ➡ Use ear protections if the noise level is high.
- ➡ Keep flammable material away from the welding area.
- ➡ Do not weld on containers which contain flammable material.
- ➡ Do not weld near refuelling areas.
- ➡ Do not weld on easily flammable surfaces.
- ➡ Do not use the welder to defrost (thaw) pipes.
- ➡ Remove the electrode from the electrode holder, when not welding.
- ➡ Avoid inhaling fumes by providing a ventilation system or, if not possible, use an approved air breather.
- ➡ Do not work in closed areas where there is no fresh air flow.
- ➡ Protect face and eyes (protective mask with suitable dark lens and side screens), ears and body (non-flammable protective clothers).



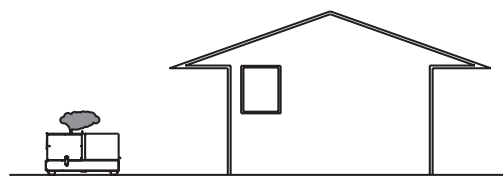
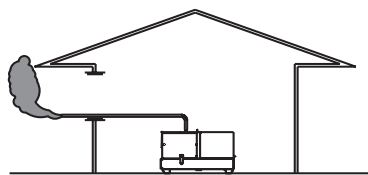
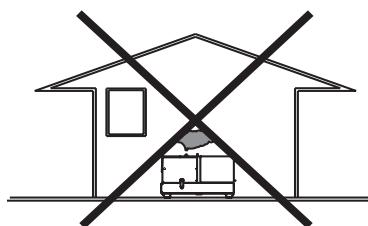
INSTALLATION AND ADVICE BEFORE USE

GASOLINE ENGINES

- ☞ Use in open space, air swept or vent exhaust gases, which contain the deadly carbone oxyde, far from the work area.

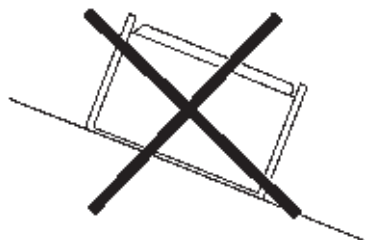
DIESEL ENGINES

- ☞ Use in open space, air swept or vent exhaust gases far from the work area.

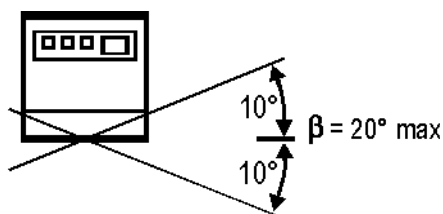
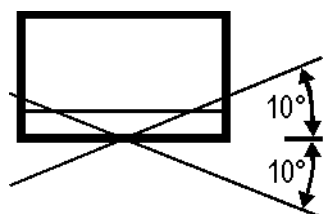


POSITION

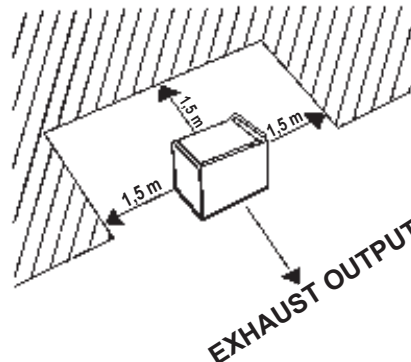
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



Check that the air gets changed completely and the hot air sent out does not come back inside the set so as to cause a dangerous increase of the temperature.



- ☞ Make sure that the machine does not move during the work: **block** it possibly with tools and/or devices made to this purpose.

MOVES OF THE MACHINE

- ☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

PLACE OF THE MACHINE

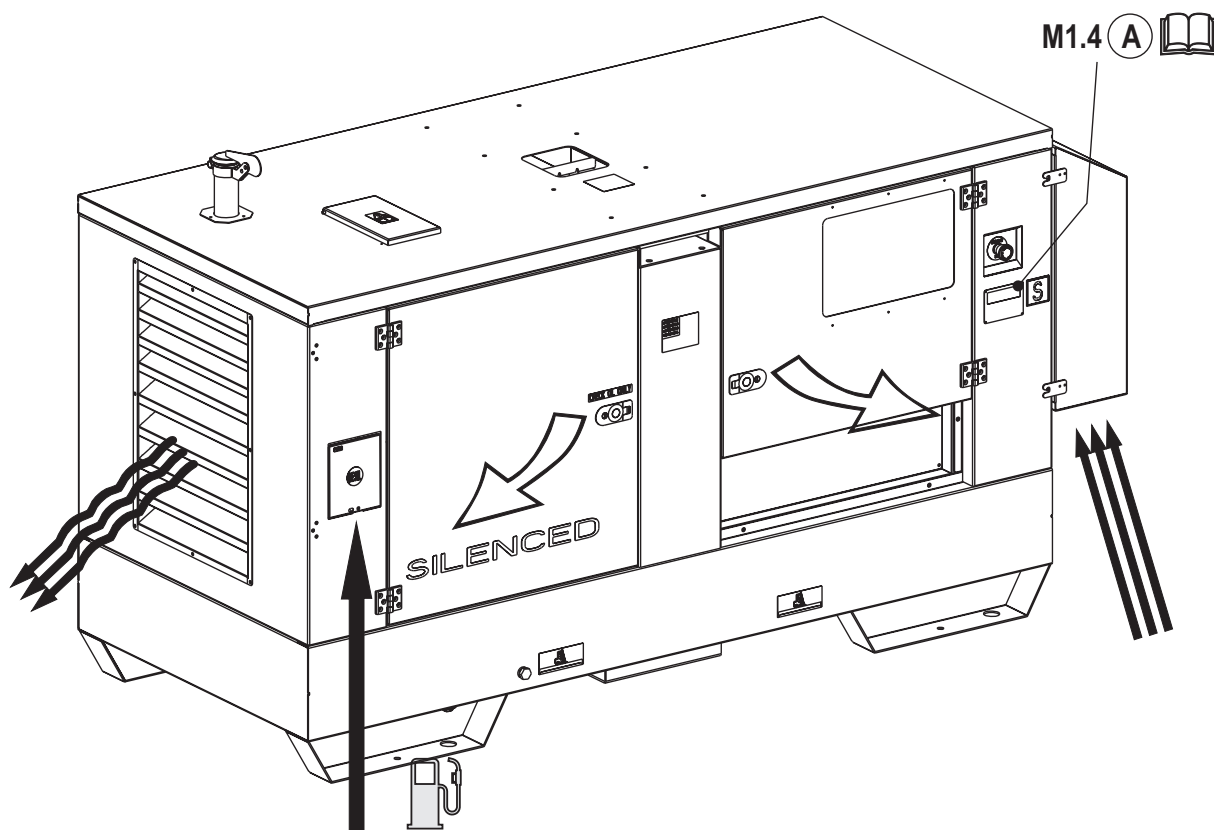
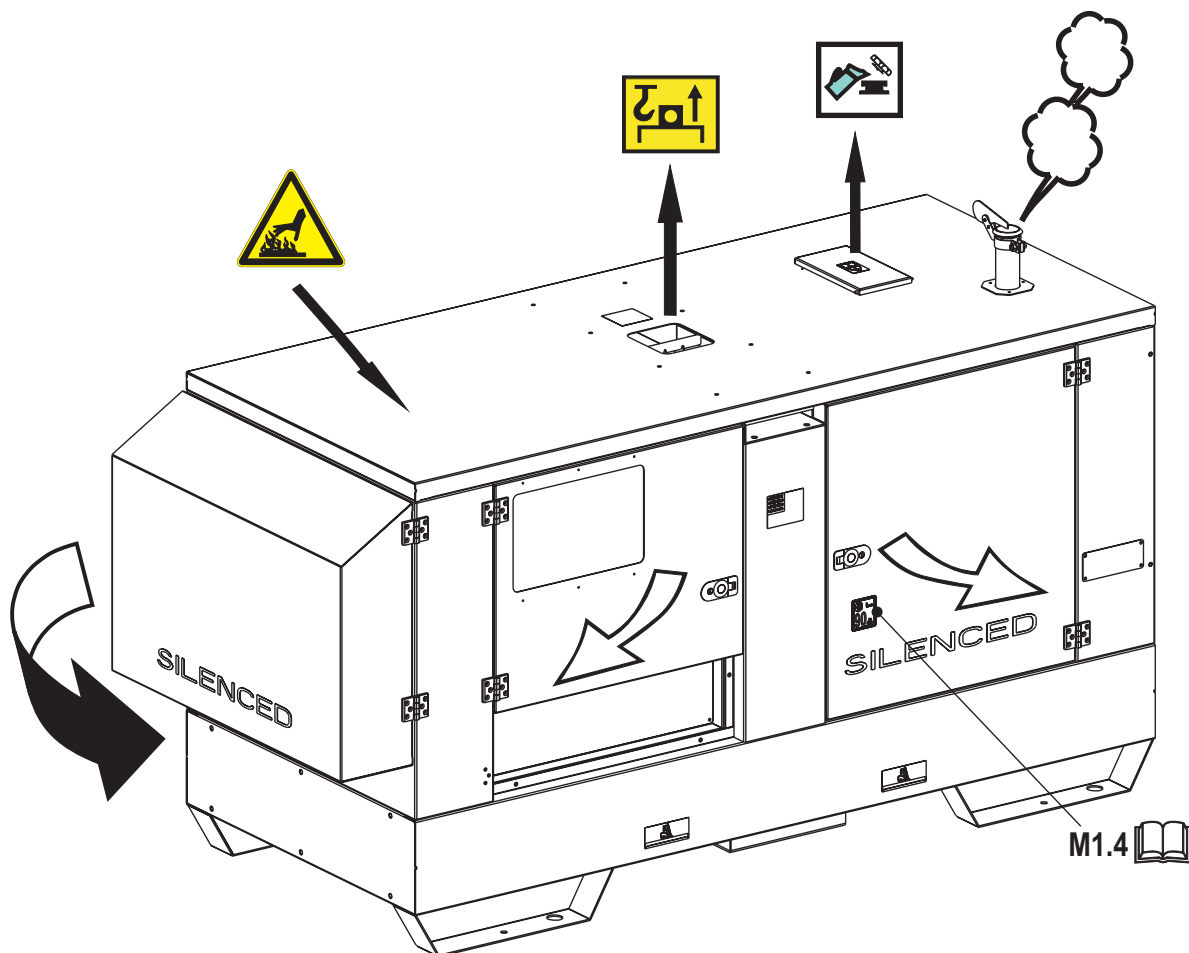


ATTENTION



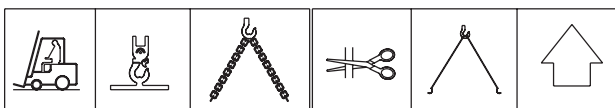
For a safer use from the operator **DO NOT** fit the machine in locations with high risk of flood.

Please do not use the machine in weather conditions which are beyond IP protection shown both in the data plate and on page named "technical data" in this same manual.



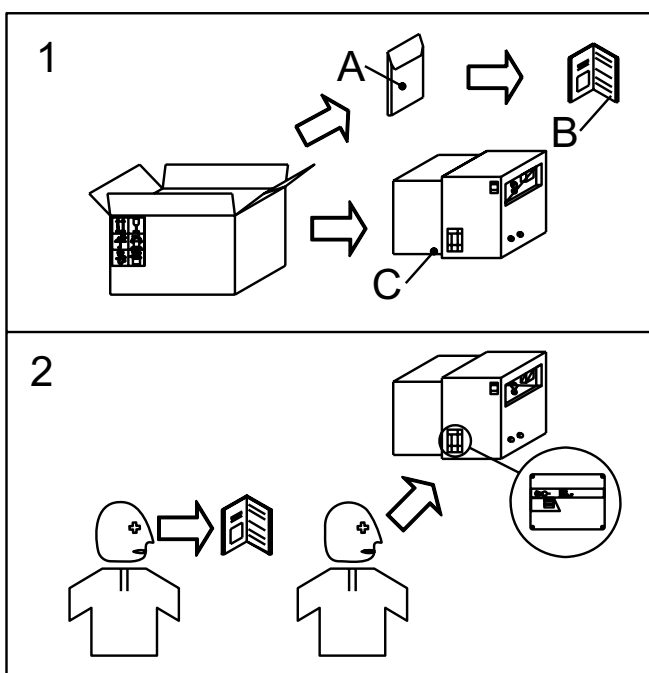
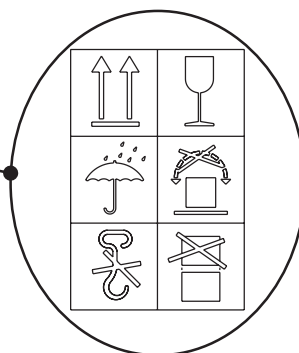
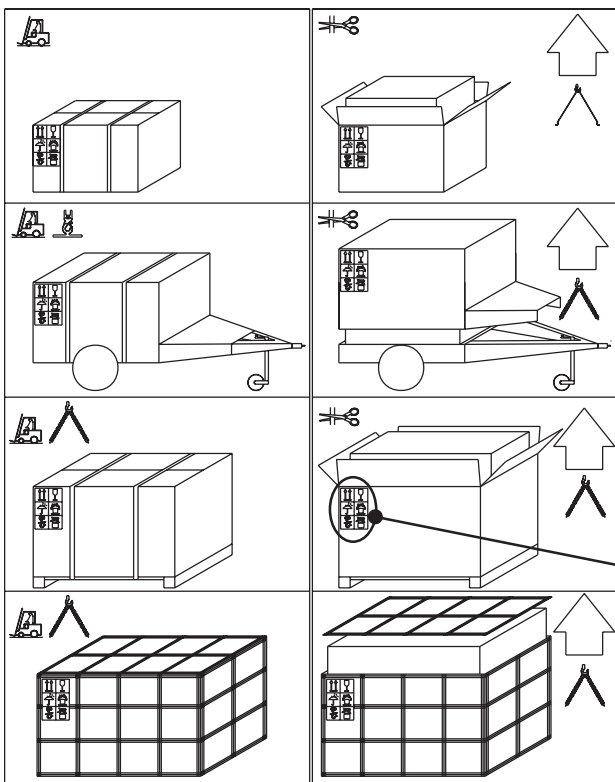


NOTE



Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with its packaging, and conforms to local rules and regulations. When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling or taking away of parts contained inside the packing or in the set. In case you find damages, rough handling or absence of parts (envelopes, manuals, etc.), we advise you to inform immediately our Technical Service.

For eliminating the packing materials, the User must keep to the norms in force in his country.



- 1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
- 2) Read: the user's manual (B), the plates fixed on the machine, the data plate.





NOTE

Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.

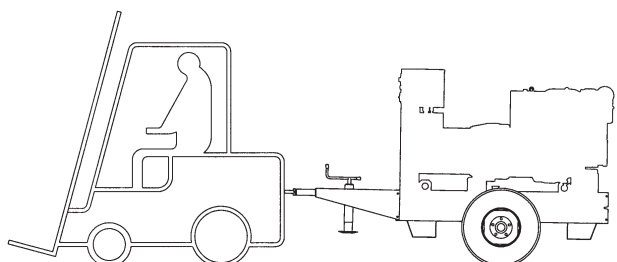
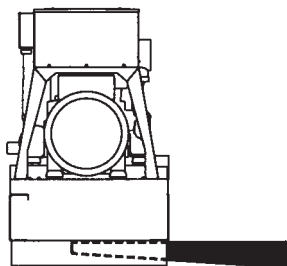
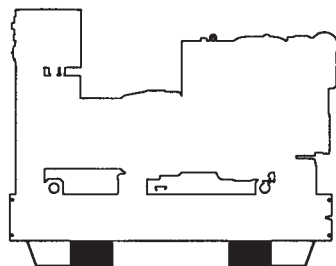
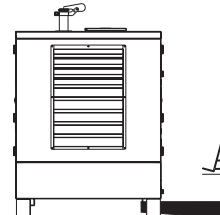
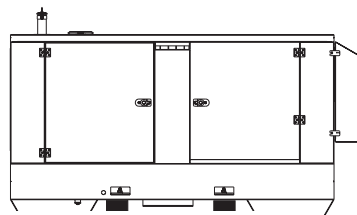
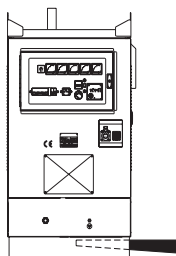
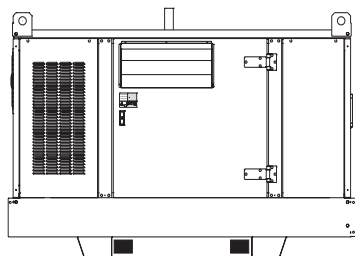
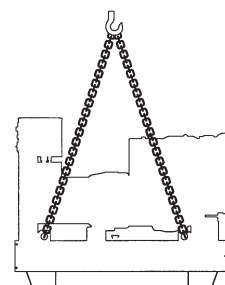
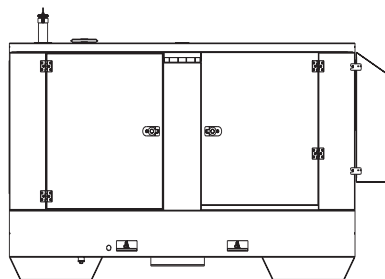
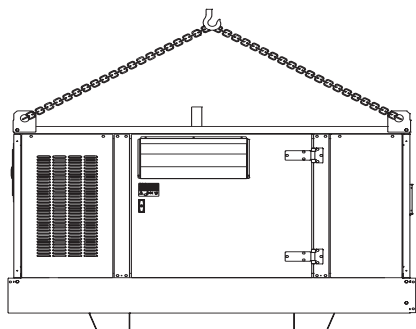
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.

Only authorized persons involved in the transport of the machine should be in the area of movement.

DO NOT LOAD OTHER PARTS WHICH CAN MODIFY WEIGHT AND BARICENTER POSITION.

IT IS STRICTLY FORBIDDEN TO DRAG THE MACHINE MANUALLY OR TOW IT BY ANY VEHICLE (model with no CTL accessory).

If you did not keep to the instructions, you could damage the structure of the machine.





ATTENTION

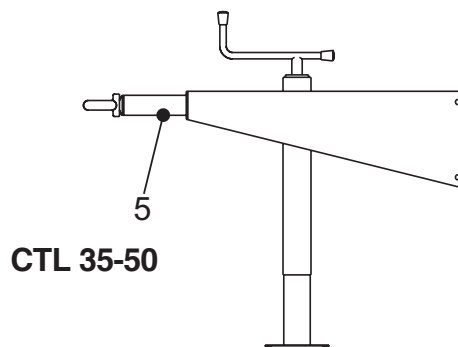
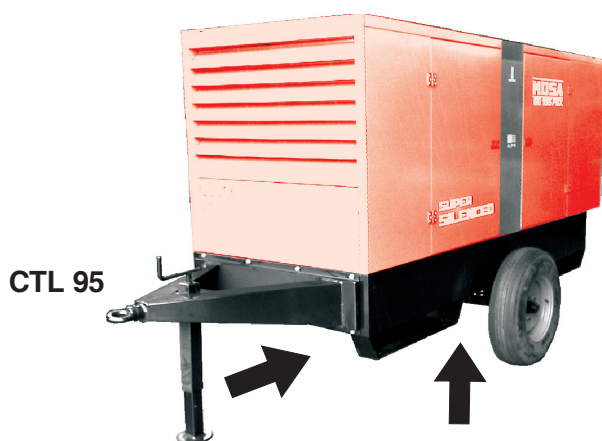
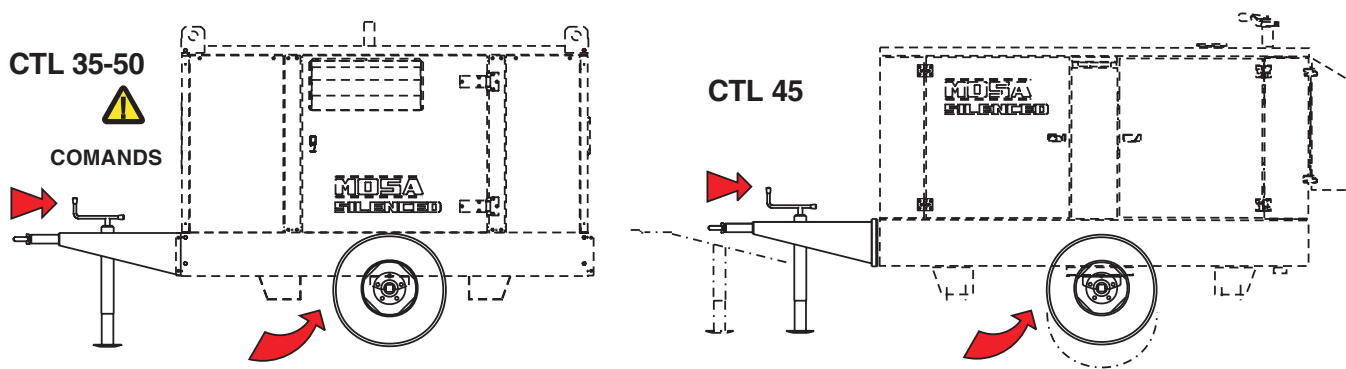
The CTL accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.

TRAILERS

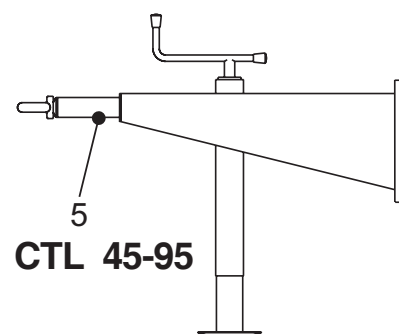
The machines provided for assembling the CTL accessory (slow towing trolley) can be towed up to a **maximum** speed of **40 Kms/hour** on asphalted surfaces.

Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possession of the requirements by national and foreign traffic norms.

Nota: Lift the machine and assemble the parts as shown in the drawing



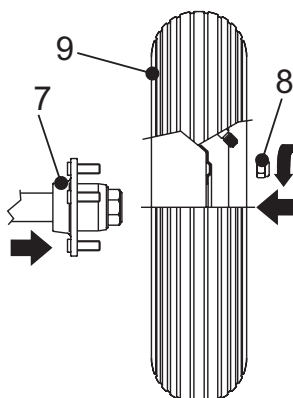
CTL 35-50



CTL 45-95

For assembling the generating set on the trolley CTL 35-45 - 50 - 95 please keep to following instructions:

- 1) - Lift the generating set (by means of suitable hook)
- 6) - Assemble on the machine the towbar (5) complete of foot with the M10x20 screws, nuts and washers.
- 7) - Assemble the axle (7) to the base of the machine with the M10x20 screws and relative washers (two per part) so that their supports coincide.
- 8) - Insert the wheel (9) on the axle then twist the selflocking nut (8).
- 9) - Pump the tyre (9) bringing the pressure to 4 atms for the CTL 35-45-50 and 5/6 for the CTL 95.
- 10) - Lower the machine to the ground and place the parking foot definitively (regulating at the best height).



ATTENTION

Do not substitute the original tires with other types.





BATTERY WITHOUT MAINTENANCE



Connect the cable + (positive) to the pole + (positive) of the battery (after having taken away the protection), by properly tightening the clamp.

Check the state of the battery from the colour of the warning light which is in the upper part.

- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced

DO NOT OPEN THE BATTERY.



LUBRICANT

RECOMMENDED OIL

MOSA recommends selecting **AGIP** engine oil. Refer to the label on the motor for the recommended products.

 PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SIGMA TURBO PLUS 15W/40 API CG4 - ACEA E3	OLIO MOTORE DIESEL DIESEL ENGINE OIL <input type="checkbox"/>
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL <input type="checkbox"/>
AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% + H ₂ O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97) <input type="checkbox"/>

Please refer to the motor operating manual for the recommended viscosity.

REFUELLING AND CONTROL:

Carry out refuelling and controls with motor at level position.

1. Remove the oil-fill tap (24)
2. Pour oil and replace the tap
3. Check the oil level using the dipstick (23); the oil level must be comprised between the minimum and maximum indicators.



AIR FILTER

Check that the dry air filter is correctly installed and that there are no leaks around the filter which could lead to infiltrations of non-filtered air to the inside of the motor.



FUEL



ATTENTION



Do not smoke or use open flames during refuelling operations, in order to avoid explosions or fire hazards.

Fuel fumes are highly toxic; carry out operations outdoors only, or in a well-ventilated environment.



Avoid accidentally spilling fuel. Clean any eventual leaks before starting up motor.

Refill the tank with good quality diesel fuel, such as automobile type diesel fuel, for example.

For further details on the type of diesel fuel to use, see the motor operating manual supplied.

Do not fill the tank completely; leave a space of approx. 10 mm between the fuel level and the wall of the tank to allow for expansion.

In rigid environmental temperature conditions, use special winterized diesel fuels or specific additives in order to avoid the formation of paraffin.



ATTENTION

It is dangerous to fill the motor with too much oil, as its combustion can provoke a sudden increase in rotation speed.





COOLING LIQUID



ATTENTION



Do not remove the radiator tap with the motor in operation or still hot, as the liquid coolant may spurt out and cause serious burns. Remove the tap very carefully.

Remove the tap and pour the liquid coolant into the radiator; the quantity and composition of the liquid coolant are indicated in the motor operating manual. Replace the tap, ensuring it is perfectly closed.

After refilling operations, allow the motor to run for a brief time and check the level, as it may have diminished due to air bubbles present in the cooling circuit; restore the level with water.

To replace the liquid coolant, follow the operations described in the motor operating manual.

ATTENTION:

The engine cooling system is originally filled with coolant type:

AGIP ANTIFREEZE EXTRA

During the engine life it is strongly recommended to use the same coolant type. This is because a coolant change would require a careful cleaning of the cooling system, which is not an easy job. A lack in tacking these precautions would result in the mix of different additives used in different coolants which would originate gelatinous substances capable of obstructing the cooling system.



GROUNDING CONNECTION

The grounding connection to an earthed installation **is obligatory** for all models equipped with a differential switch (circuit breaker). In these groups the generator star point is generally connected to the machine's earthing; by employing the TN or TT distribution system, the differential switch guarantees protection against indirect contacts.

In the case of powering complex installations requiring or employing additional electrical protection devices, the coordination between the protection devices must be verified.

For the grounding connection, use the terminal (12); comply to local and/or current regulations in force for electrical installations and safety.

	
PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SIGMA TURBO PLUS 15W/40 API CG4 - ACEA E3	OLIO MOTORE DIESEL DIESEL ENGINE OIL <input type="checkbox"/>
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL <input type="checkbox"/>
AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% + H ₂ O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97) <input type="checkbox"/>





Check daily



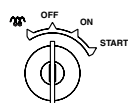
NOTE

Do not alter the factory adjustment of the engine and do not touch the sealed parts.

1500 / 1800 RPM ENGINES

These engines start their normal operating speed.

IGNITION KEY



The ignition key is a part of the EP5 engine protection device and has three positions.

STARTING THE ENGINE

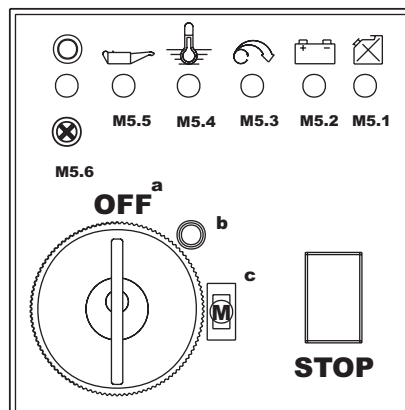
Introduce the key (Q1), turn it clockwise completely, leaving it as soon as the engine starts.

NB.: for safety reason the key must be kept by qualified personel.

Let the engine run for some minutes before drawing the load.

ENGINE PROTECTION (EP5)

The EP5 device monitors the engine oil pressure, the engine water temperature and the rpm of the engine. If the oil pressure is too low, the water temperature too high or the speed too high, the device shuts-down the engine. For a few seconds after the engine is started the shut-down function is inhibited to allow the engine to start.



M5.1 (yellow) Fuel reserve
M5.2 (yellow) Battery charge
M5.3 (red) Overspeed
M5.4 (red) High temperature
M5.5 (red) Low oil pressure
M5.6 (green) Protection unit on

LOW OIL PRESSURE (M5.5)

In the event of low oil pressure the LED lights and the engine is shut-down.

HIGH TEMPERATURE (M5.4)

If the water temperature is too high the LED lights and the engine is shut-down.

OVERSPEED (M5.3)

If the engine speed goes over the preset value the LED lights and the engine is shutdown. The nominal frequency (50 or 60 Hz) is monitored.

FUEL RESERVE (M5.1)

If the fuel level reaches the reserve level the LED lights and the sirene sounds and the engine is shut-down.

BATTERY CHARGE (M5.2)

If the battery is not being charged the LED light but the engine does not stop. The visual signal will stay on until the charging system is repaired.

STOP BUTTON

The stop button can be used to stop the engine at any time. Push and hold the button until the engine stops.



CAUTION

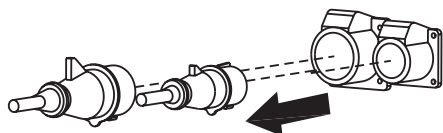
RUNNING-IN

During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, in any case please stick to the rules given in the engine use manual.

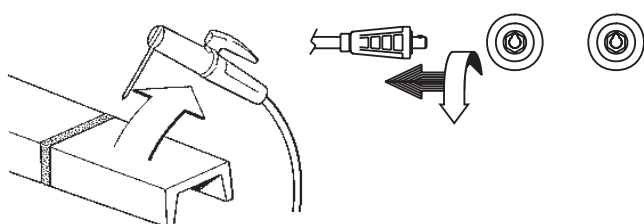


Before stopping the engine **it is compulsory** to:

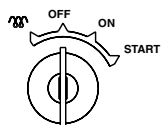
- disconnect or shut off any loads which are connected to the unit auxiliary outputs.



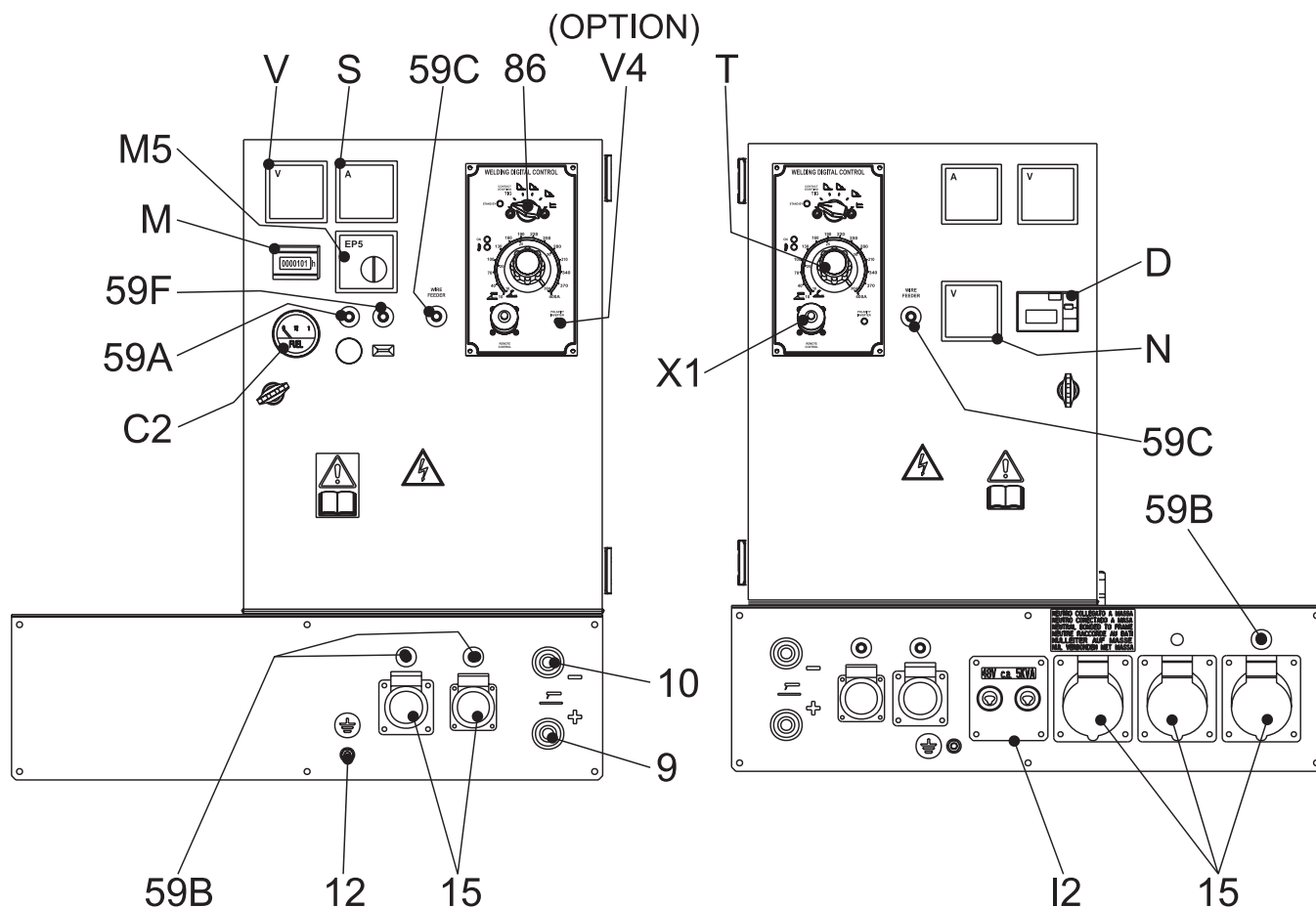
- stop welding



To stop the engine:



Turn the starter key to the off position.



Pos.	Descrizione	Description	Description	Referenzliste
9	Presa di saldatura (+)	Welding socket (+)	Prise de soudage (+)	Schweißbuchse (+)
10	Presa di saldatura (-)	Welding socket (-)	Prise de soudage (-)	Schweißbuchse (-)
12	Presa di messa a terra	Earth terminal	Prise de mise à terre	Erdanschluß
15	Presa di corrente in c.a.	A.C. socket	Prises de courant en c.a.	Steckdose AC
59A	Protezione termica motore	Engine thermal switch	Protection thermique moteur	Thermoschutz Motor
59B	Protezione termica corrente aux	Aux current thermal switch	Protection thermique courant aux.	Thermoschutz Hilfsstrom
59C	Prot. termica alim. 42V trainafile	Supply thermal switch wire feeder	Protection thermique alimenta- tion 42V fil	Thermoschutz 42V Drahtvorschub
59F	Protezione termica elettropompa	Fuel injection pump thermal switch	Protection thermique électro-pompe	Thermoschutz elektropumpe
C2	Indicatore livello combustibile	Fuel level light	Indicateur niveau carburant	Anzeige Kraftstoffpegel
D	Interruttore differenziale (30mA)	G.F.I.	Interrupteur différentiel	FI-Schalter (GFI)
I2	Presa di corrente 48V (c.a.)	48V A.C. socket	Prise de soudage 48V (c.a.)	Steckdose 48V AC
M	Contaore	Hour counter	Compte-heures	Stundenzähler
M5	Unità controllo motore EP5	Engine control unit EP5	Protection moteur EP5	Motorschutz EP5
N	Voltmetro	Voltmete	Voltmètre	Voltmeter
Q7	Selettore modalità saldatura	Welding selector mode	Sélecteur madalité soudage	Schweissschalter
S	Amperometro di saldatura	Welding ammeter	Ampéromètre de soudage	Amperemeter Schweißstrom
T	Regolatore corrente di saldatura	Welding current regulator	Régulateur courant soudage	Schweißstromregler
V	Voltmetro tensione saldatura	Welding voltage voltmeter	Voltmètre tension soudage	Voltmeter Schweißspannung
V4	Comando invertitore di polarità	Polarity inverter control	Commande inverseur polarité	Polwendeschalter
X1	Presa per comando a distanza	Remote control socket	Prise pour télécommande	Steckdose Fernbedienung



ATTENTION

Access to non qualified personnel is prohibited in proximity of these areas:

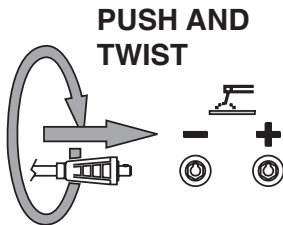
- the control panel (front-end) - the engine exhaust fumes - the welding process.



This symbol (regulation EN 60974-1 on safety requirements for arc welding apparatus) indicates that the engine driven welder is suitable for use in environments with an increased risk of electrical shock.

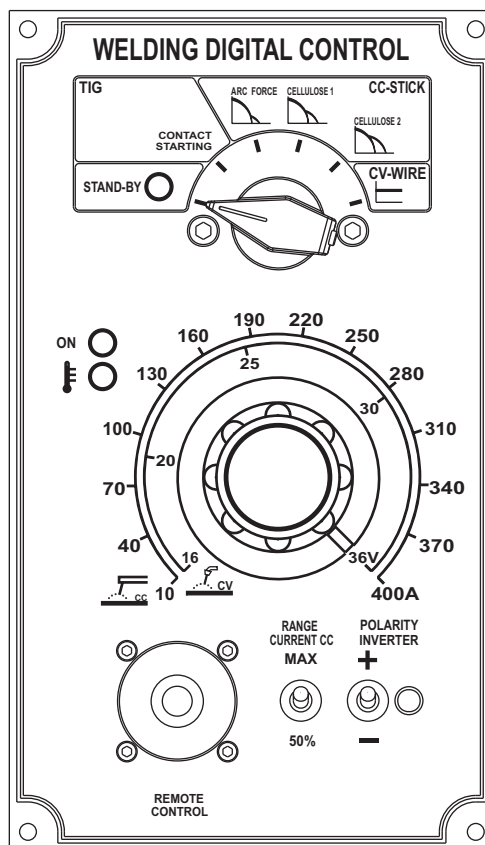
WELDING CABLE CONNECTION

Fully insert the welding cable plugs into the corresponding sockets turning them clockwise to lock them in position.



- Make sure that the ground clamp, whose cable must be connected to the + or - terminal, depending on the type of electrode, makes a good connection and is near to the welding position.

Pay attention to the two polarities of the welding circuit, which must not come in electric contact between themselves.



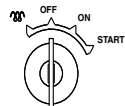
GETTING STARTED

1) After having prepared the machine (charged the battery, put in oil and fuel) the machine is ready for operation.

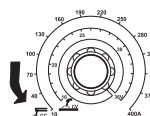
Before starting the engine please note the following:

- The welder should only be operated by qualified personnel with experience in working with engine driven welders.
- Check the oil level daily. Fuel should be put in before starting the engine.
- Before using the welder or the auxiliary power let the engine warm up and before stopping the engine let it run without load to cool down.

Refer to the following instructions regarding the function of the various controls on the front panel.

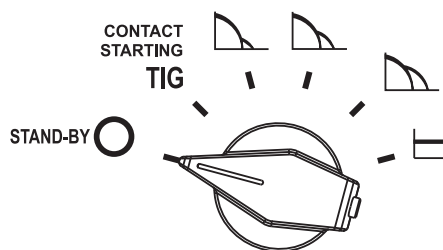


2) Start the engine of the welder



3) Turn the welding current/voltage adjusting knob to the minimum setting.

SETTING THE WELDING PROCESS



There is a manual switch for selecting the various welding processes on the welding control panel.

There are 5 processes to choose from:

- 1 for TIG welding
- 3 for STICK welding (electrode)
- 1 for MIG/MAG welding (continuous wire).

The switch can also be set to “stand-by” (first position). In this position there is no current at the welding connections; led “ON” off.

The process can be selected either before or after starting the motor powered welder.

After selecting the mode, the “ON” LED lights up.

If the wirefeeder connector is connected on remote control connector the “ON” LED lights only when the button torch is pressed.

TIG MODE

Contact starting TIG

This position is specifically for TIG welding. To create the arc simply place the tip of the TIG electrode on the piece that requires welding then gently move the tip away. The arc starts automatically and at the same time the welding current rises to the preset value, first using the welding current adjustment knob which is on the lower part of the control panel. The welding current can be adjusted continuously from a minimum of 10 A to a maximum which depends on the power of the machine 400 A, 500 A, 600 A.



WARNING

For EP1 version it is compulsory to accelerate the engine manually.

STICK MODE (Electrode)

Features C.C. (Constant Current)

There are three stick modes which feature increasing "arc forces" so that the arc has different levels of penetration according to the electrode and/or welding position.

MIG/MAG MODE (continuous wire)

Features C.V. (Constant Voltage)

All wire type welding processes can be carried out, naked or coated.

The voltage can be adjusted using the same knob which adjusts the current in STICK mode. Adjustment is continuous and goes from a minimum of 15 V to a maximum of 36V, 40 V.

Optional remote control

The welding current can also be set from a distance using the optional remote control. Once the remote control is connected to the connector (X1), the current is controlled by the remote control. To return to front panel control remove the connector.

Optional VRD program (Voltage Reduction Device VRD)

When you choose the program stick or stick arc force the Open Circuit Voltage (OCV) go up, red light switch ON and green light switch OFF, but only for about 3", then the OCV go down, green light switch ON and red light switch OFF, about 11V and stop there, until the welder start welding. When you make a short circuit with the stick the OCV immediately go up, so you can start to welding.

Inversion of polarity (Optional, available on request)

In order to invert polarity, press the switch on the remote control unit.

By selecting "inversion" the "ON" LED switches off and the voltage at the welding socket becomes zero. The power contactor is switched inside the electrical box and the voltage reappears at the welding sockets. The "ON" LED switches back on at the same time.


The "Invert polarity" LED on the front panel near the welding current adjuster switches on.

You cannot invert polarity in "MIG/MAG" mode.


PROTECTIONS

The Welding Digital Control features 3 protections for the control and chopper.

1) "ON" LED blinking

 When the engine of the welder is started the control unit automatically goes to the stand by mode for few instants (stand-by LED on) and performs a self-diagnosis of the current sensor connector and power source voltage + 15V; than the last process is loaded (on led turned ON). In case of malfunction the "ON" LED blinks.


2) Red LED blinking

 The chopper has a thermal protection, which intervenes in case the operating temperature exceeds 85°C.

If the protection intervenes, the red LED begins to flash and the welding current/voltage goes to zero. In this case do not switch off the welder, since the alternator fan will help cool down the chopper more quickly.

After a few minutes, the LED will automatically switch itself off and the welding voltage/current will once again be available at the plugs.

3) Red LED continuously lit

 If an anomalous current is detected in the chopper, the control blocks the conversion immediately, the output welding current/voltage goes to zero and the red LED lights up. To reset everything, it is necessary to switch off the machine.

If the protections 1) and 3) should intervene, it is best to immediately contact the nearest authorised Service Centre.

DIGITAL INSTRUMENTS

(Optional, available on request)

Two digital instruments showed the operating value of welding current and welding voltage.

WIRE FEEDER CONNECTED WITH REMOTE CONTROL CONNECTOR

Wire feeder connection

Connect the wire feeder to the welder with the welder turned off:

- Welding cable between the machine's (9) welding plug (+) and the wire feeder.
- Welding cable between the machine's (10) welding plug (-) and the piece to be welded.
- Control/power cable between the machine's connector (X1) and the corresponding connector on the wire feeder.

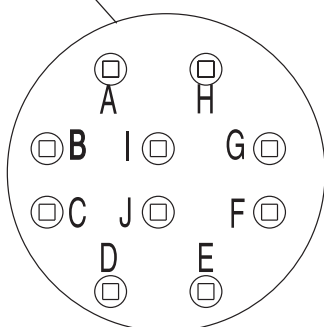
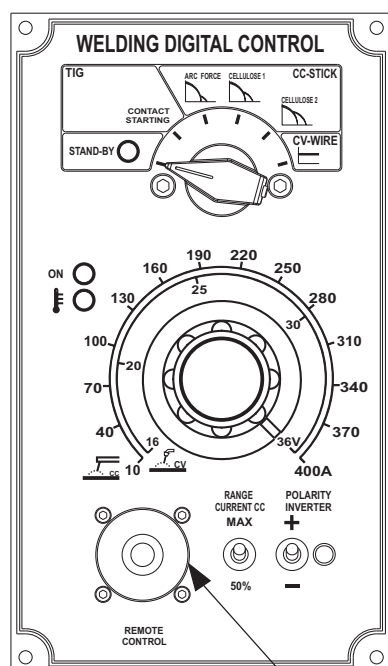
Start the machine welder

The "ON" LED will be off and will turn on only when there is voltage at the welding plugs (and therefore at the wire).

The voltage is only present when the welding torch button is pressed.

The setting of the welding voltage is done using the knob on the wire feeder.

The adjusting knob on the welder is automatically inhibited.



WARNING

You can use the wire feeder only by respecting the pin configuration as shown on the below mentioned table.

"WIRE FEEDER connected without remote control connector"

Welding voltage is always present on welding sockets and also VRD is active.

- Welding cable between the machine's (9) welding plug (+) and the wire feeder.
- Welding cable between the machine's (10) welding plug (-) and the piece to be welded.

The setting of the welding voltage is done by using the knob on the front panel.

NAME OF CONTACT	DESCRIPTION
A (electric ground)	To potentiometer RC1 "terminal a"
B	To potentiometer RC1 "central b"
C (5 V d.c.)	To potentiometer RC1 "terminal c"
D	short circuit with contact "C"
E	To switch "Polarity Inverter"
F (5 V d.c.)	(Close for negative polarity)
G	Return from switch on CV welding gun, 1-phase (44 - 48V a.c.)
H (welding ground)	Welding ground for d.c. voltmeter on wire feeder
I (44 - 48V a.c.)	Voltage supply for wire feeder
J (44 - 48V a.c.)	



WARNING

It is strictly forbidden to connect the group to the public mains and/or to any other source of electric power.

GENERATION IN AC (ALTERNATING CURRENT)

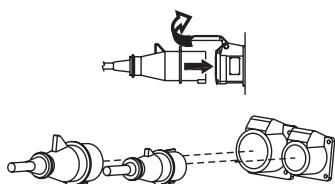
Make certain of the efficiency of the ground connection (12). - See page M20 -.

Position the GFI switch to ON.

☞ Voltage is now immediately available to the AC sockets.

Verify that the voltmeter displays the nominal voltage value (at no load it is close to +10% of the nominal value).


Connect the electric devices to be powered to the AC sockets, using suitable plugs and cables in good condition.



☞ Verify that the electrical characteristics (voltage/frequency/power) of the device being powered are compatible with those of the generator.

Low frequency and/or voltage can irreparably damage some electrical devices.

Verify that the ground lead of the electrical appliance/tool to be powered is correctly connected to the terminal of the plug.

☞ For double insulation devices with the symbol , the plug's ground terminal does not need to be grounded.

THERMAL PROTECTION

The monophase outputs are protected against overloads by the thermal protection (59B).

When the rated current is exceeded, the protection intervenes to cut off the voltage to the AC socket.

☞ **Notes:** the intervention of the thermal protection is not instantaneous, but reacts according to an overcurrent/time characteristic, whereby the greater the overcurrent the quicker the intervention. In case of intervention by the protection device, verify that the total power for the loads connected does not exceed the declared rating and decrease if necessary. Disconnect the loads and wait a few



CIRCUIT BREAKER



minutes to allow the thermal protection to cool down.

Before resetting by pressing the central button and then

connect the load again.

If the protection should intervene again, replace it with another one with matching intervention current specifications and/or contact the Service Department.

. Note: do not forcibly hold the central button of the thermal protection device to prevent its intervention, as this could irreparably **damage** the unit's alternator.

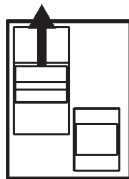
☞ Note: the three phase output does not require any protection against overcurrents, since it uses a self-protecting asynchronous type alternator.

GROUND FAULT INTERRUPTOR SWITCH

The high-sensitivity ground fault interruptor switch [G.F.I.] (30mA) (D), guarantees protection against indirect contacts due to faulty ground currents .

When the G.F.I. switch picks up a faulty ground current that is higher than 30mA, it intervenes by immediately cutting off voltage to the AC sockets.

In case of intervention by this protection device, reset the G.F.I. switch by moving the lever to the ON position. In case of another intervention, verify that there are no faults in the tools connected, or replace the G.F.I. switch with another one of matching specifications and/or contact the Service Department.



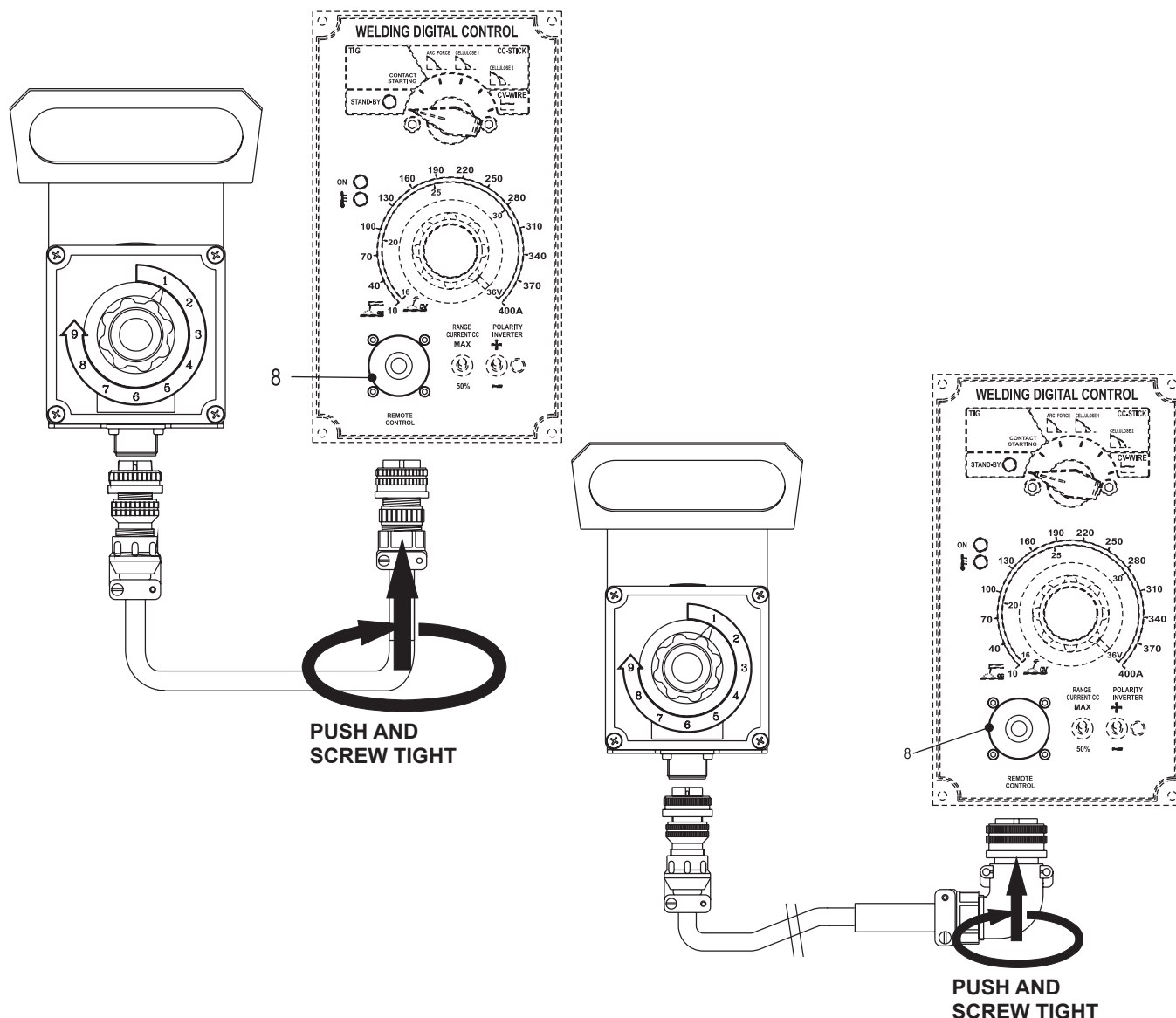
☞ **Notes:** Verify the operation of the G.F.I. switch at least once a month by pressing the TEST button. The generator must be running and the G.F.I. lever in the ON position.

SIMULTANEOUS USE

The welder's alternator permits the simultaneous use of auxiliary power and welding current. The auxiliary power available to the AC plugs (15) diminishes as the welding current drawn increases. The table on page M1.6 TECHNICAL SPECIFICATIONS shows the amount of auxiliary power available as the welding current varies.

COMBINED USE

The output available from the various auxiliary power sockets is limited, not only by the declared output of the unit but also by the capacity of each individual socket.



The remote control RC, which regulates the welding current in the CC (STICK welding) mode and the welding voltage in the CV (MIG/MAG welding), is connected to the front panel by means of a multipole connector.



When the remote control is connected to the remote control connector (8), it is functional and automatically excludes the front panel regulation. The remote control can also be connected to the connector on the wire feeder front panel but in this case it is necessary to switch the wire feeder commutator so it can operate.

Adjust the welding current control knob to the correct current for the diameter and type of electrode being welded.

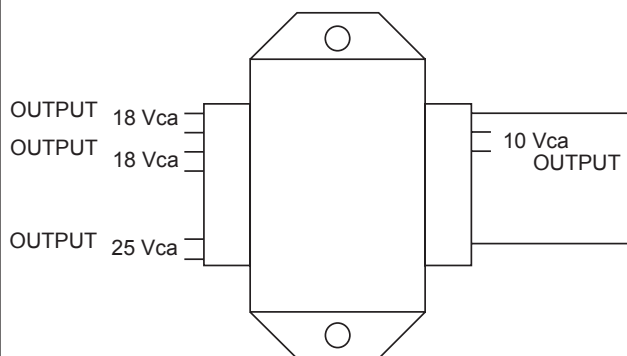


ATTENTION

When the RC is not used, it is necessary to disconnect the multipole connector

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
WELDING		
P1 All functions performed by the WDC are regular, but there is no tension on the welding sockets	1) Position of regulation potentiometer incorrect knob	1) Adjust the position of the WDC regulation knob on the potentiometer spindle so that the potentiometer is not completely at the end of its travel when the knob reaches its minimum position. Idem for the RC1 remote control knob.
P2 Malfunction in the selection of welding processes or in their confirmation on other functions performed by the WDC	1) WDC defective	1) Replace the WDC.
P3 Blinking "ON" LED	1) Current sensor connector P3 2) Aux power voltage value ($\pm 15V$) too high or too low	1) Connector P3 not inserted or defective - see drawing 5 2) Check the aux transformer, see drawing 1
P4 Blinking red LED 	1) The chopper thermic protection is intervening 2) Temperature sensor situated on chopper (NTC resistor) short circuited or open. 3) WDC defective	1) The output is inhibited automatically; let the motor continue to run to cool down the chopper, and after a few minutes the LED will automatically switch off and there will be current/voltage once again at the welding sockets. 2) Check chopper connector, drawing 2, from pin 1-2. The resistor must be bigger than 1800Ω and less than $25 K\Omega$, otherwise the led blinking. Replace the chopper. In the meantime you can work cutting the wire which arrives to pin 1 - pin 2 and put on it one resistor $10 K\Omega$. In this case the thermic protection don't work but you can use the machine. 3) Replace the WDC.
P5 Red LED always on 	1) WDC defective 2) Chopper defective 3) Current sensor defective	1) Switch off the machine and start it up again; if the LED remains off try to weld, verifying that the welding is regular; if the LED lights up again. Replace the WDC. 2) Check the chopper as shown on drawing 2. 3) Replace the sensor.
P6 PHG1 remote does not operate.	1) Remote control (or cable) defective. 2) WDC defective.	1) Check the remote control as drawing 4 2) Replace the WDC
P7 The welding current is always at max or always at minimum	1) Potentiometer on WDC defective 2) WDC defective 3) Welding current sensor defective	1) Check from pin 1-12 connector P4 (pin 1 - ground see drawing 3) 2) Replace the WDC 3) Replace the current sensor
P8 No voltage at the welding sockets in CV mode	1) Defective wire feeder cable 2) Defective wire feeder 3) Defective WDC	1) Check the connections pin to pin of the wire 2) Check the wire feeder 3) Without wire feeder cable put the pin I in short circuit with G on remote control connector, the led ON must be light - WDC ok otherwise change WDC
P9 No welding or generation output	1) Short circuit of chopper. 2) Short circuit of generation unit. 3) Alternator defective.	1) Disconnect the chopper and re-start the machine; if there is now an output present, replace the chopper 2) Disconnect the auxiliary output circuit and re-start the machine; if there is now an output present, there is a short circuit in the auxiliary output circuit or in one of the components 3) Disconnect all outputs on the alternator (welding and generation unless the output going to the condensers) and check the capacity of the condensers. Restart the machine, if there is still no output, replace the alternator.

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
WELDING WITH V.R.D.		
P10 The welding tension after 3 sec isn't less enough (plus in 12V dc)	1) Net R.C. defective or disconnected from + or - welding socket 2) WDC defective.	1) Check the net R.C. Check the connections. 2) Replace the WDC.
GENERATING		
P1 Voltmeter shows no voltage or low voltage but actual voltage at the sockets is OK.	1) Voltmeter malfunction	1) Replace the voltmeter.
P2 No three-phase voltage present at the socket(s).	1) Differential switch not inserted 2) Differential switch malfunction	1) Turn on the switch. 2) Replace the switch.
P3 No single phase voltage one socket but voltmeter reading is normal and there is voltage on the other sockets.	1) Intervention of thermal switch due to excessive current. 2) Thermal switch malfunction.	1) Push in the thermal switch. 2) Replace the thermal switch.
P4 No voltage present. (See problem P9)	1) Short circuit present on the generator outputs.	1) Disconnect all outputs on the generator except for those on the condensers and re-start machine; check for voltage on condensers.
MOTOR		
P1 The engine does not start or stops immediately after startup.	1) Low battery voltage, battery dead or defective. 2) Presence of air in the fuel supply circuit. 3) Circuit breaker engine protection 4) Engine solenoid	1) Check the warning light "state of the battery": - Green colour: battery OK - Black colour: battery to be recharged - White colour: battery to be replaced - DO NOT OPEN THE BATTERY. 2) Carry out de-aeration on the fuel system. See engine operating manual. 3) Insert the circuit breaker. In case the problem persists, check the electrical circuit and eliminate the problem. Call an authorised service centre. 4) See engine manual
P2 Engine stops due to intervention of EP5/EP7/ES.	1) Engine temperature too high or insufficient oil pressure. 2) High temperature sensor or oil pressure defective. 3) EP5/EP7/ES protection defective	1) Check oil level. 2) Replace the malfunctioning sensor. 3) Replace the protection.
P3 The battery is not charged.	1) Battery charger alternator defective. 2) Battery charger warning light defective.	1) Replace 2) Replace
P4 For other problems, refer to the attached engine manual		

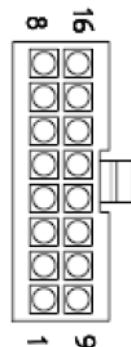


Check the transformer in this way:

input: 220 Vac
output: 18 Vac, 25 Vac, 10 Vac

DRAWING 1

CHOPPER TEST
CHECK THE FOLLOWING RESISTIVE VALUES
ON THE CHOPPER CONNECTOR



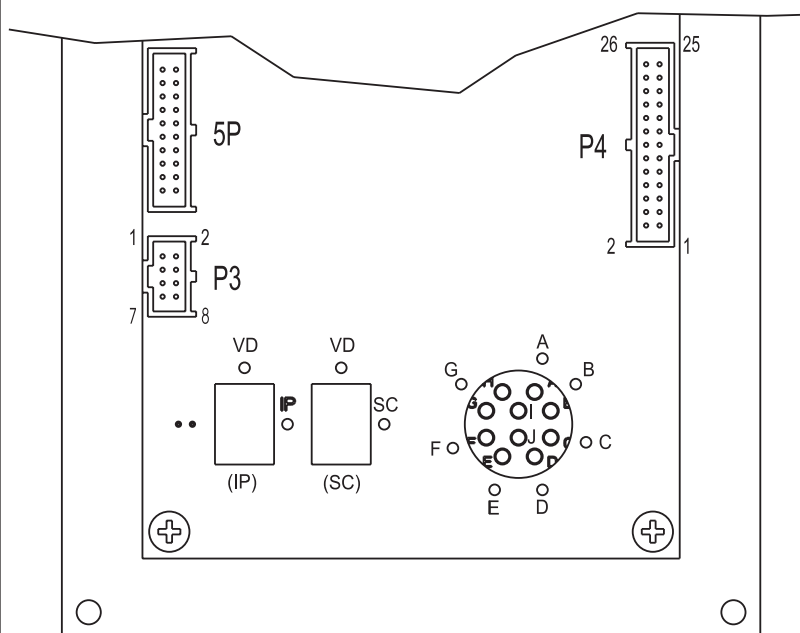
VIEW FROM INSERTION SIDE

Check the resistive values between the following pairs of pins, by means of an ohmmeter.

Pins	CT 350	DSP 400 DSP 2x400 DSP 500	DSP 600
1 - 9	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%
2 - 10	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%
3 - 11	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%
4 - 12	-	3,33 K Ω \pm 5%	3,33 K Ω \pm 5%
5 - 13	-	-	3,33 K Ω \pm 5%
8 - 16	1,8 \div 25 K Ω \pm 5% (In funzione della temperatura)		

DRAWING 2

Connector P4 on WDC

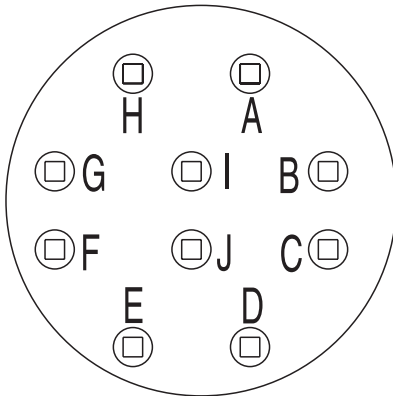


DRAWING 3

POTENTIOMETER TEST

To check if the potentiometer of the WDC works correctly perform the following test:

- 1) Start the welding machine and let it run at nominal r.p.m.
- 2) Connect a multimeter set for VDC measurement between pins 1 (GND) and 12 of connector P4
- 3) Turn the knob completely AKW and check that the voltage is $\leq 0,5V$
- 4) Turn the knob gradually KW and check that the voltage increases up to a value $\geq 4,5V$ at rotation stop. the voltage shall increase in a regular way with the rotation.

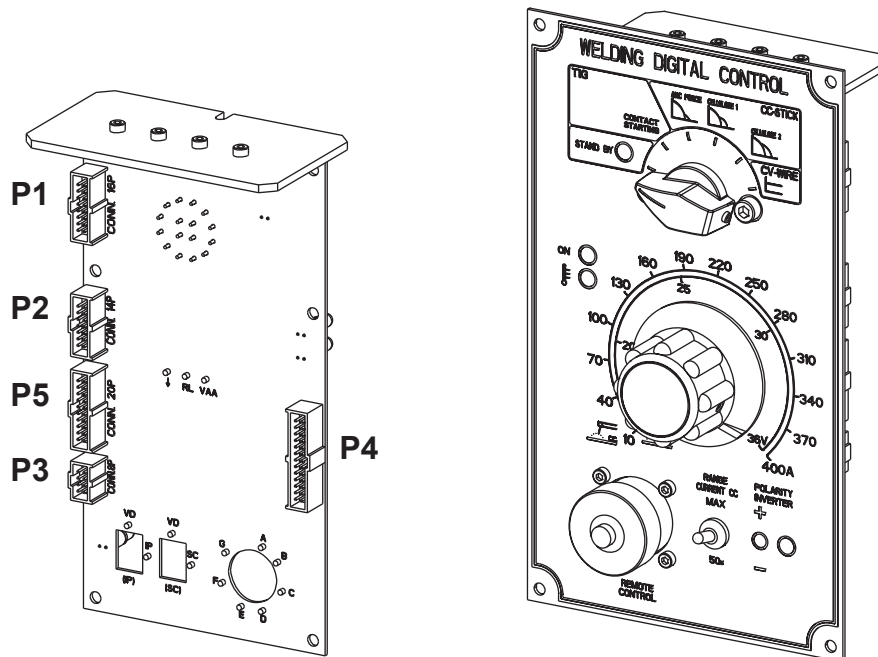


Put the knob on RC1 at minimum/max, put one ohmmeter from pin A - B and measure the resistance.

Knob	Resistance
Minimum	50 ÷ 100 Ω
Max	4,5 - 4,7 KΩ

DRAWING 4

P1 Supply connector
P2 Chopper connector
P3 Current sensor connector
P4 - P5 Free



DRAWING 5



WARNING



**MOVING
PARTS
can injure**

- Have **qualified** personnel do maintenance and troubleshooting work.
- Stop the engine before doing any work inside the machine. If for any reason the machine must be operated while working inside, **pay attention** moving parts, hot parts (exhaust manifold and muffler, etc.) electrical parts which may be unprotected when the machine is open.
 - Remove guards only when necessary to perform maintenance, and replace them when the maintenance requiring their removal is complete.
 - Use suitable tools and clothes.
 - Do not modify the components if not authorized.
- See pag. M1.1 -



**HOT surface
can
hurt you**

NOTE

By maintenance at care of the utilizer we intend all the operatios concerning the verification of mechanical parts, electrical parts and of the fluids subject to use or consumption during the normal operation of the machine.

For what concerns the fluids we must consider as maintenance even the periodical change and or the refills eventually necessary.

Maintenance operations also include machine cleaning operations when carried out on a periodic basis outside of the normal work cycle.

The repairs **cannot be considered** among the maintenance activities, i.e. the replacement of parts subject to occasional damages and the replacement of electric and mechanic components consumed in normal use, by the Assistance Authorized Center as well as by MOSA.

The replacement of tires (for machines equipped with trolleys) must be considered as repair since it is not delivered as standard equipment any lifting system.

The periodic maintenance should be performed according to the schedule shown in the engine manual. An optional hour counter (M) is available to simplify the determination of the working hours.



IMPORTANT



In the maintenance operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.

ENGINE and ALTERNATOR

PLEASE REFER TO THE SPECIFIC MANUALS PROVIDED.

Every engine and alternator manufacturer has

maintenance intervals and specific checks for each model: it is necessary to consult the specific engine or alternator USER AND MAINTENANCE manual.

VENTILATION

Make certain there are no obstructions (rags, leaves or other) in the air inlet and outlet openings on the machine, alternator and motor.

ELECTRICAL PANELS

Check condition of cables and connections daily. Clean periodically using a vacuum cleaner, **DO NOT USE COMPRESSED AIR.**

DECALS AND LABELS

*All warning and decals should be checked once a year and **replaced** if missing or unreadable.*

STRENUOUS OPERATING CONDITIONS

Under extreme operating conditions (frequent stops and starts, dusty environment, cold weather, extended periods of no load operation, fuel with over 0.5% sulphur content) do maintenance more frequently.

BATTERY WITHOUT MAINTENANCE DO NOT OPEN THE BATTERY

The battery is charged automatically from the battery charger circuit supplied with the engine.

Check the state of the battery from the colour of the warning light which is in the upper part.

- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced



NOTE

THE ENGINE PROTECTION NOT WORK WHEN THE OIL IS OF LOW QUALITY BECAUSE NOT CHARGED REGULARLY AT INTERVALS AS PRESCRIBED IN THE OWNER'S ENGINE MANUAL.

In case the machine should not be used for more than 30 days, make sure that the room in which it is stored presents a suitable shelter from heat sources, weather changes or anything which can cause rust, corrosion or damages to the machine.

☞ Have **qualified** personnel prepare the machine for storage.

GASOLINE ENGINE

Start the engine: It will run until it stops due to the lack of fuel.

Drain the oil from the engine sump and fill it with new oil (see page M25).

Pour about 10 cc of oil into the spark plug hole and screw the spark plug, after having rotated the crankshaft several times.

Rotate the crankshaft slowly until you feel a certain compression, then leave it.

In case the battery, for the electric start, is assembled, disconnect it.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

DIESEL ENGINE

For short periods of time it is advisable, about every 10 days, to make the machine work with load for 15-30 minutes, for a correct distribution of the lubricant, to recharge the battery and to prevent any possible blocking of the injection system.

For long periods of inactivity, turn to the after sales service of the engine manufacturer.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

In case of necessity for first aid and of fire prevention, see page. M2.5.



IMPORTANT



In the storage operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.

✎ Have **qualified** personnel disassemble the machine and dispose of the parts, including the oil, fuel, etc., in a correct manner when it is to be taken out of service.

In case of necessity for first aid and fire prevention, see page M2.5.

As cust off we intend all operations to be made, at utilizer's care, at the end of the use of the machine. This comprises the dismantling of the machine, the subdivision of the several components for a further reutilization or for getting rid of them, the eventual packing and transportation of the eliminated parts up to their delivery to the store, or to the bureau encharged to the cust off or to the storage office, etc.

The several operations concerning the cust off, involve the manipulation of fluids potentially dangerous such as: lubricating oil and battery electrolyte.

The dismantling of metallic parts liable to cause injuries or wounds, must be made wearing heavy gloves and using suitable tools.

The getting rid of the various components of the machine must be made accordingly to rules in force of law a/o local rules.

Particular attention must be paid when getting rid of:

lubricating oils, battery electrolyte, and inflammable liquids such as fuel, cooling liquid.

The machine user is responsible for the observance of the norms concerning the environment conditions with regard to the elimination of the machine being cust off and of all its components.

In case the machine should be cust off without any previous disassembly it is however compulsory to remove:

- tank fuel
- engine lubricating oil
- cooling liquid from the engine
- battery

NOTE: BCS is involved with custing off the machine **only** for the second hand ones, when not reparable. This, of course, after authorization.

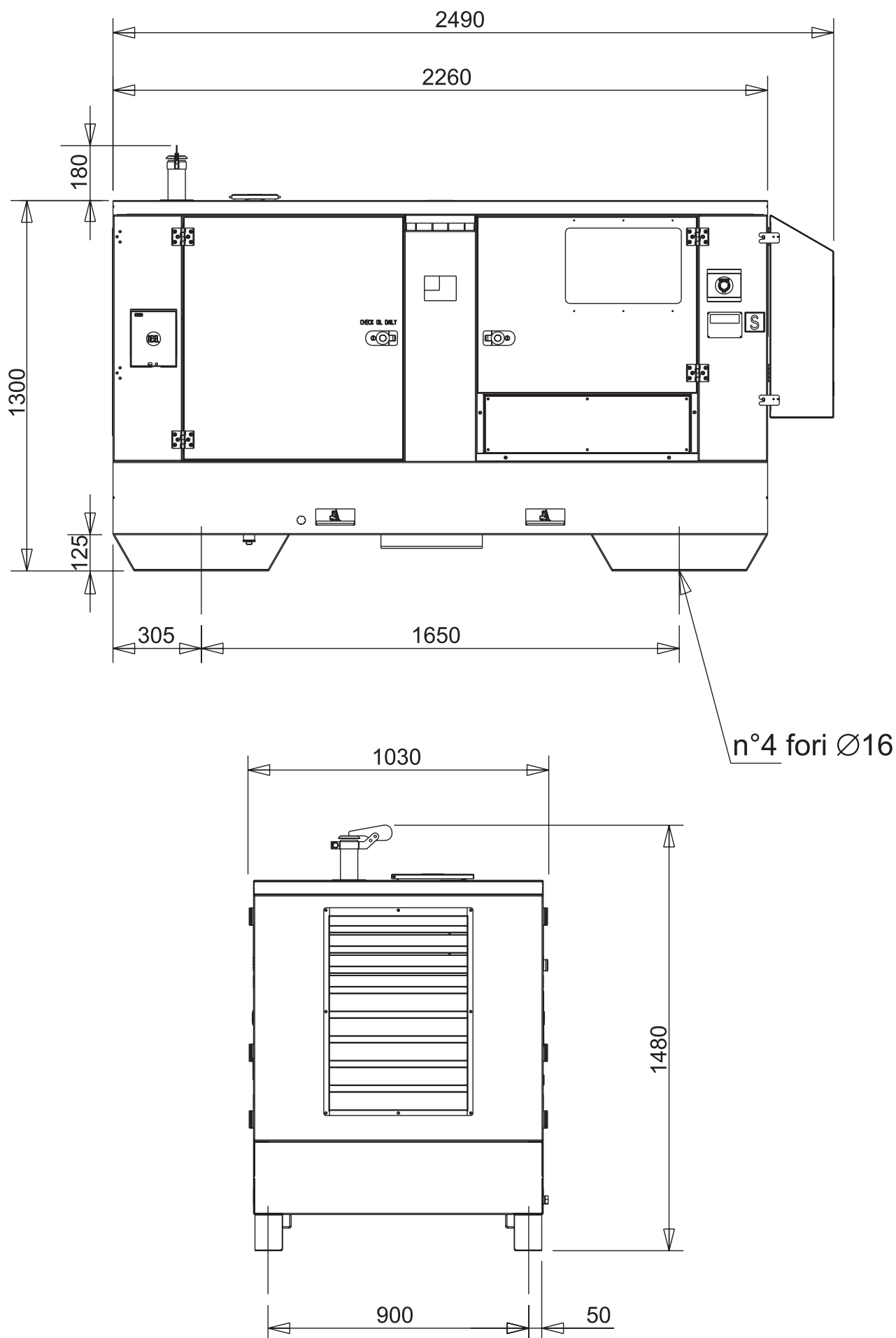


IMPORTANT



In the cust-off operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.



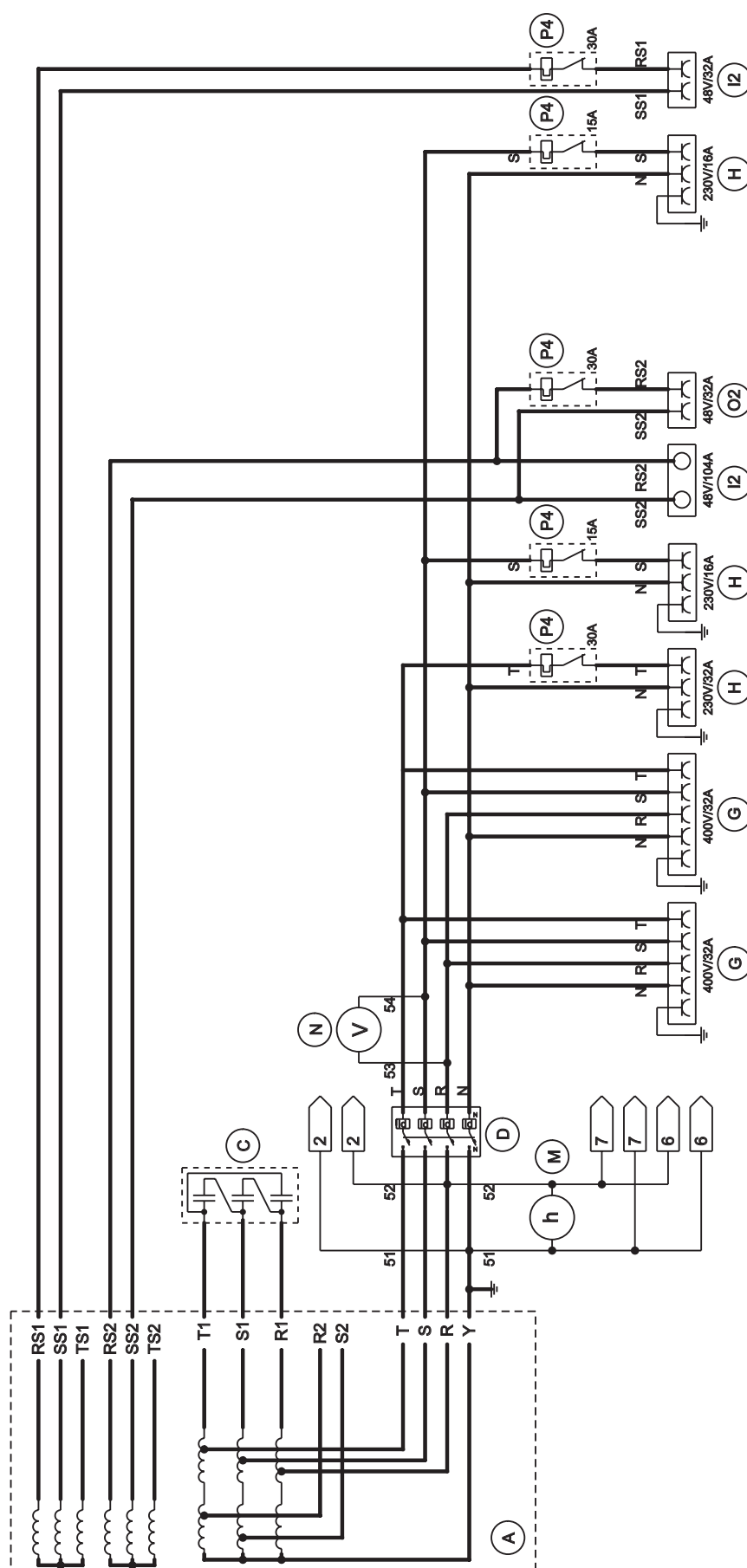


A : Alternator	A3 : Insulation monitoring	A6 : Commutator/switch
B : Wire connection unit	B3 : E.A.S. connector	B6 : Key switch, on/off
C : Capacitor	C3 : E.A.S. PCB	C6 : QEA control unit
D : G.F.I.	D3 : Booster socket	D6 : Connector, PAC
E : Welding PCB transformer	E3 : Open circuit voltage switch	E6 : Frequency rpm regulator
F : Fuse	F3 : Stop push-button	F6 : Arc-Force selector
G : 400V 3-phase socket	G3 : Ignition coil	G6 : Device starting motor
H : 230V 1phase socket	H3 : Spark plug	H6 : Fuel electro pump 12V c.c.
I : 110V 1-phase socket	I3 : Range switch	I6 : Start Local/Remote selector
L : Socket warning light	L3 : Oil shut-down button	L6 : Choke button
M : Hour-counter	M3 : Battery charge diode	M6 : Switch CC/CV
N : Voltmeter	N3 : Relay	N6 : Connector – wire feeder
P : Welding arc regulator	O3 : Resistor	O6 : 420V/110V 3-phase transformer
Q : 230V 3-phase socket	P3 : Sparkler reactor	P6 : Switch IDLE/RUN
R : Welding control PCB	Q3 : Output power unit	Q6 : Hz/V/A analogic instrument
S : Welding current ammeter	R3 : Electric siren	R6 : EMC filter
T : Welding current regulator	S3 : E.P.4 engine protection	S6 : Wire feeder supply switch
U : Current transformer	T3 : Engine control PCB	T6 : Wire feeder socket
V : Welding voltage voltmeter	U3 : R.P.M. electronic regulator	U6 : DSP chopper PCB
Z : Welding sockets	V3 : PTO HI control PCB	V6 : Power chopper supply PCB
X : Shunt	Z3 : PTO HI 20 l/min push-button	Z6 : Switch and leds PCB
W : D.C. inductor	W3 : PTO HI 30 l/min push-button	W6 : Hall sensor
Y : Welding diode bridge	X3 : PTO HI reset push-button	X6 : Water heater indicator
	Y3 : PTO HI 20 l/min indicator	Y6 : Battery charge indicator
A1 : Arc striking resistor	A4 : PTO HI 30 l/min indicator	A7 : Transfer pump selector AUT-0-MAN
B1 : Arc striking circuit	B4 : PTO HI reset indicator	B7 : Fuel transfer pump
C1 : 110V D.C./48V D.C. diode bridge	C4 : PTO HI 20 l/min solenoid valve	C7 : "GECO" generating set test
D1 : E.P.1 engine protection	D4 : PTO HI 30 l/min solenoid valve	D7 : Flooting with level switches
E1 : Engine stop solenoid	E4 : Hydraulic oil pressure switch	E7 : Voltmeter regulator
F1 : Acceleration solenoid	F4 : Hydraulic oil level gauge	F7 : WELD/AUX switch
G1 : Fuel level transmitter	G4 : Preheating glow plugs	G7 : Reactor, 3-phase
H1 : Oil or water thermostat	H4 : Preheating gearbox	H7 : Switch disconnecter
I1 : 48V D.C. socket	I4 : Preheating indicator	I7 : Solenoid stop timer
L1 : Oil pressure switch	L4 : R.C. filter	L7 : "VODIA" connector
M1 : Fuel warning light	M4 : Heater with thermostat	M7 : "F" EDC4 connector
N1 : Battery charge warning light	N4 : Choke solenoid	N7 : OFF-ON-DIAGN. selector
O1 : Oil pressure warning light	O4 : Step relay	O7 : DIAGNOSTIC push-button
P1 : Fuse	P4 : Circuit breaker	P7 : DIAGNOSTIC indicator
Q1 : Starter key	Q4 : Battery charge sockets	Q7 : Welding selector mode
R1 : Starter motor	R4 : Sensor, cooling liquid temperature	R7 : VRD load
S1 : Battery	S4 : Sensor, air filter clogging	S7 : 230V 1-phase plug
T1 : Battery charge alternator	T4 : Warning light, air filter clogging	T7 : V/Hz analogic instrument
U1 : Battery charge voltage regulator	U4 : Polarity inverter remote control	U7 : Engine protection EP6
V1 : Solenoid valve control PCBT	V4 : Polarity inverter switch	V7 : G.F.I. relay supply switch
Z1 : Solenoid valve	Z4 : Transformer 230/48V	Z7 : Radio remote control receiver
W1 : Remote control switch	W4 : Diode bridge, polarity change	W7 : Radio remote control trasnsmitter
X1 : Remote control and/or wire feeder socket	X4 : Base current diode bridge	X7 : Isometer test push-button
Y1 : Remote control plug	Y4 : PCB control unit, polarity inverter	Y7 : Remote start socket
A2 : Remote control welding regulator	A5 : Base current switch	A8 : Transfer fuel pump control
B2 : E.P.2 engine protection	B5 : Auxiliary push-button ON/OFF	B8 : Ammeter selector switch
C2 : Fuel level gauge	C5 : Accelerator electronic control	C8 : 400V/230V/115V commutator
D2 : Ammeter	D5 : Actuator	D8 : 50/60 Hz switch
E2 : Frequency meter	E5 : Pick-up	E8 : Cold start advance with temp. switch
F2 : Battery charge trasformer	F5 : Warning light, high temperature	F8 : START/STOP switch
G2 : Battery charge PCB	G5 : Commutator auxiliary power	G8 : Polarity inverter two way switch
H2 : Voltage selector switch	H5 : 24V diode bridge	H8 : Engine protection EP7
I2 : 48V a.c. socket	I5 : Y/s commutator	I8 : AUTOIDLE switch
L2 : Thermal relay	L5 : Emergency stop button	L8 : AUTOIDLE PCB
M2 : Contactor	M5 : Engine protection EP5	M8 : A4E2 ECM engine PCB
N2 : G.F.I. and circuit breaker	N5 : Pre-heat push-button	N8 : Remote emergency stop connector
O2 : 42V EEC socket	O5 : Accelerator solenoid PCB	O8 : V/A digital instruments and led VRD PCB
P2 : G.F.I. resistor	P5 : Oil pressure switch	P8 : Water in fuel
Q2 : T.E.P. engine protection	Q5 : Water temperature switch	Q8 : Battery disconnect switch
R2 : Solenoid control PCBT	R5 : Water heater	R8 : Inverter
S2 : Oil level transmitter	S5 : Engine connector 24 poles	S8 : Overload led
T2 : Engine stop push-button T.C.1	T5 : Electronic GFI relais	T8 : Main IT/TN selector
U2 : Engine start push-button T.C.1	U5 : Release coil, circuit breaker	U8 : NATO socket 12V
V2 : 24V c.a. socket	V5 : Oil pressure indicator	V8 : Diesel pressure switch
Z2 : Thermal magnetic circuit breaker	Z5 : Water temperature indicator	Z8 : Remote control PCB
W2 : S.C.R. protection unit	W5 : Battery voltmeter	W8 : Pressure turbo protection
X2 : Remote control socket	X5 : Contactor, polarity change	X8 :
Y2 : Remote control plug	Y5 : Commutator/switch, series/parallel	Y8 :

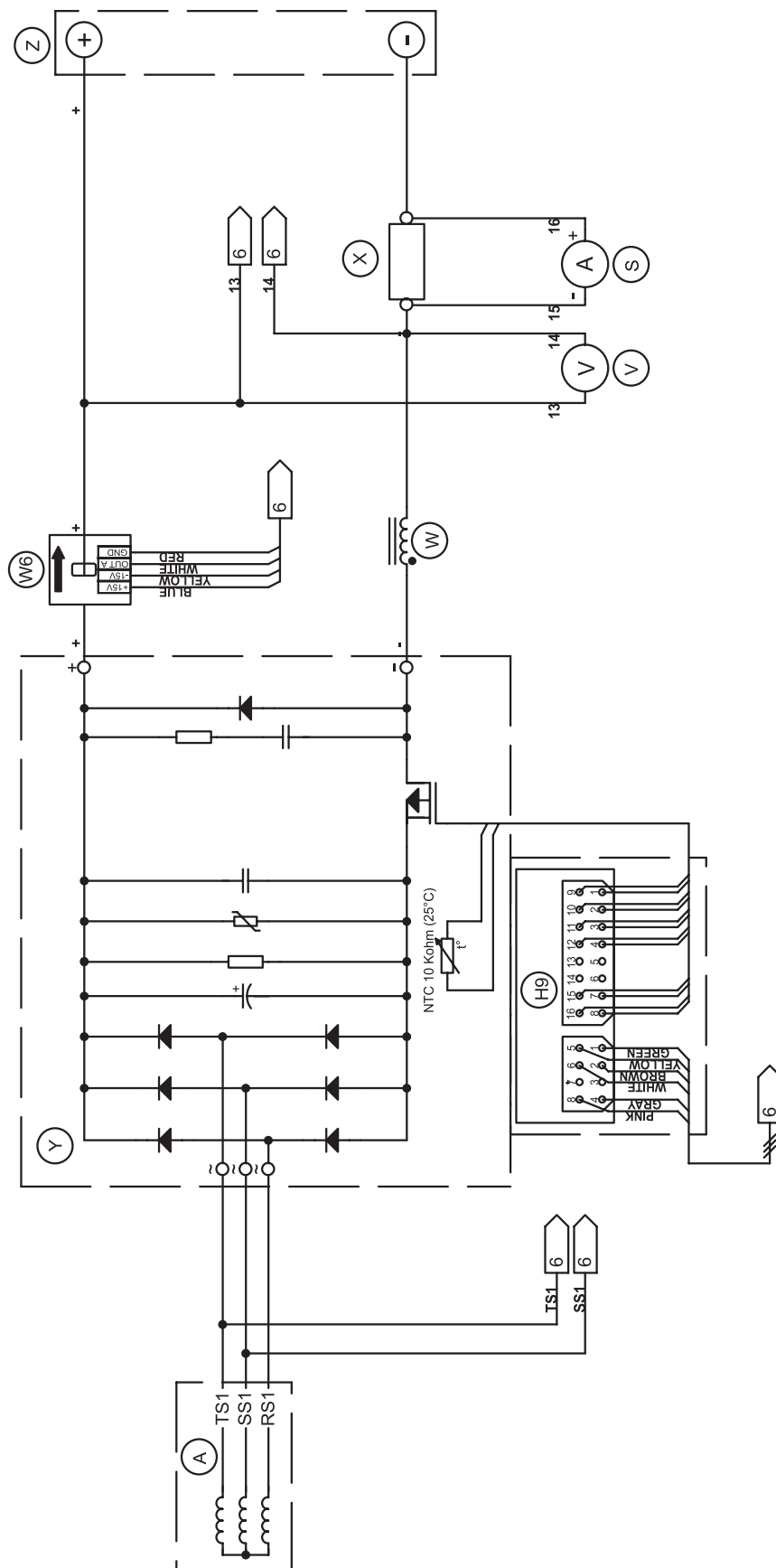





MOSSA

http://www.mosa.it	DOI ZK40013	Leopoldo IV.	ZV.10.2003	15.12.03.10-D	WSE/0
--------------------	----------------	--------------	------------	---------------	--------------

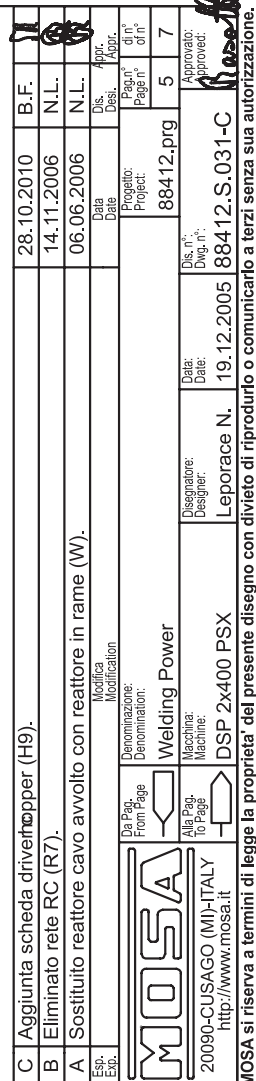


Esp. Exp.	Modifica Modification		Data Date	Dis. Desi.	Appr. Appr.
	Denominazione: Determination:		Progetto: Project:	Pag.n° Page n°	
	Aux. (400Tx2/230Mx3/48Mx3) DT		88402.prg	3	7
	Macchine: Machine:		Disegnato: Designer:	Dis. n°: Dwg. n°:	Approvato: Approved:
	DSP 2x400 PSX		08.04.2005	88402.S.020	88402
<p>20080-CUSAGO (MI)-ITALY http://www.mosa.it</p>					



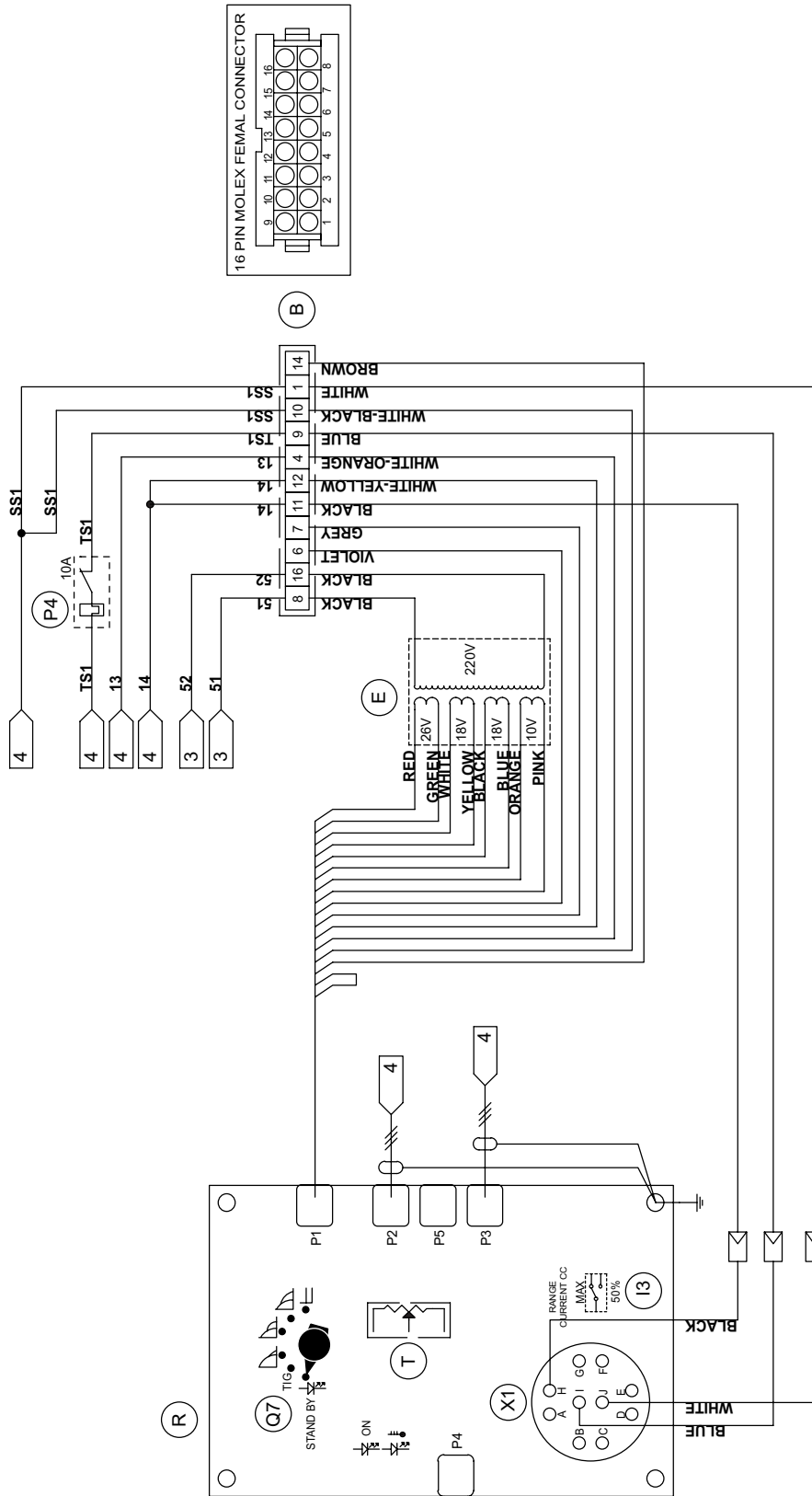
C	Aggiunta scheda driver	topper (H9).				28.10.2010	B.F.	
B	Eliminato rete	RC (R7).				14.11.2006	N.L.	
A	Sostituito reattore cavo	avvolto con reattore in rame (W).				06.06.2006	N.L.	
Esp. Exp.	Modifica		Denominatore:	Welding Power				
	Da Pag. From Page		Denominazione:					
	Alia Pag. To Page		Macchina:					
			Machine:					
20090-CUSAGO (MI)-ITALY			Dis. n.°:	88412.prg				
http://www.mosa.it			Date:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:	88412				
			Dis. n.°:	S.030-C				
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					
			Dwg. n.°:					
			Dis. n.°:					
			Disegnatore:					
			Designier:					




http://www.falmod.it	DOZ ZAT-01 0A	10.12.2003	00712.000000	
---	---------------	------------	--------------	---



http://www.mosait.it	DOI: 10.1007/978-88-470-0000-0	10.1007/978-88-470-0000-0	10.1007/978-88-470-0000-0
----------------------	--------------------------------	---------------------------	---------------------------

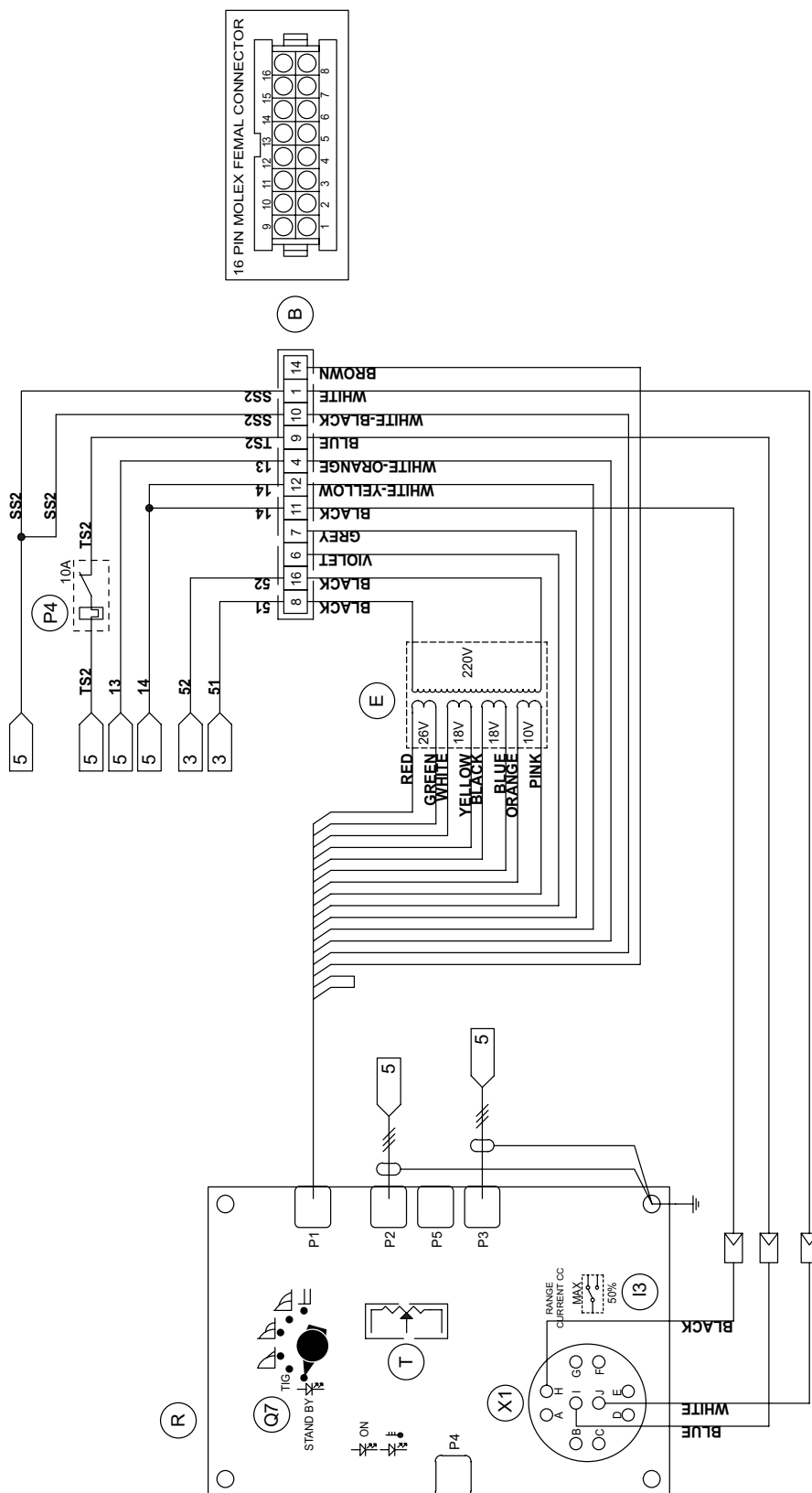
La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

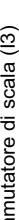


A	Aggiunto commutatore di scala (I3)										01.06.2006	N.L.	
Es. n°	Modifica										Dis. n°	Dis. n°	Appr. n°
Es.	Modifica										Data	Data	Appr.
													
Decegnazione: Welding Control													
Macchina: DSP 2x400 PSX													
http://www.mosa.it													
Disegnatore: Leporace N.													
Data: 08.05.2005													
Dis. n°: 88402.S.040-A													
Appr. n°: 													

La MOSA si riserva a termini di legge la proprieta' del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



A	Aggiunto commutatore di scala (I3)		Modifica Modification		01.06.2005		N.L.	
Esp. Exp.					Data Date		Dis. Des.	
			Denominazione: Denomination:		Dis. n°: Dwg. n°:		Dis. n°: Dwg. n°:	
Da Pag. From Page			Molding Control		Dis. n°: Dwg. n°:		Dis. n°: Dwg. n°:	
Alla Pag. To Page			Welding Machine		Dis. n°: Dwg. n°:		Dis. n°: Dwg. n°:	
20090-CUSAGO (MI)-ITALY http://www.mosa.it			Designator: Designer:		Date:		Approved:	
			DXP 2x400 DSP		08.04.2005		884402 S 041-A	
			Leopore N.				Approved:	

http://www.mosa.it		DOI Z4700 0X	Leopoldo N.	00.04.2003	003032
--------------------	---	--------------	-------------	------------	--------

MOSA guarantees that any request for spare parts will be satisfied.

To keep the machine in full working order, when replacement of MOSA spare parts is required, always ask for genuine parts only.

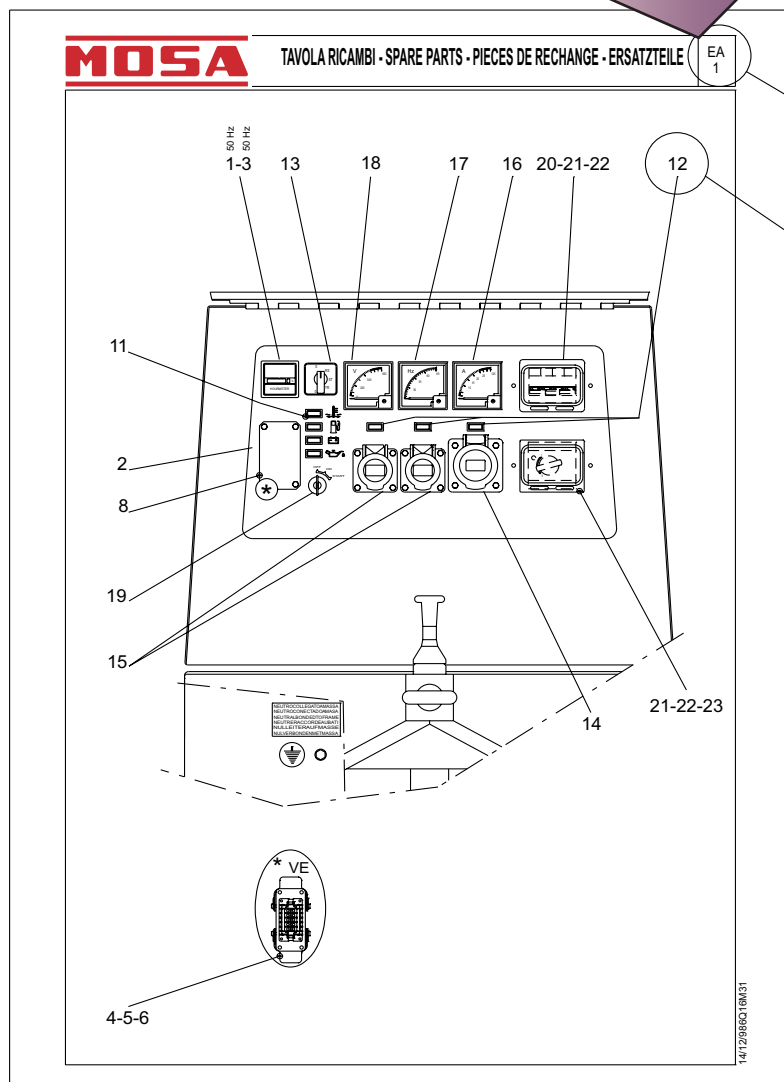
📖 The requested data are to be found on the data plate located on the machine structure, quite visible and easy to consult. *

When ordering the spare parts, it is recommended to indicate:

- 1) * serial number
- 2) * model of welder and/or generating set
- 3) ♦ n. table
- 4) ♦ n. position
- 5) quantity

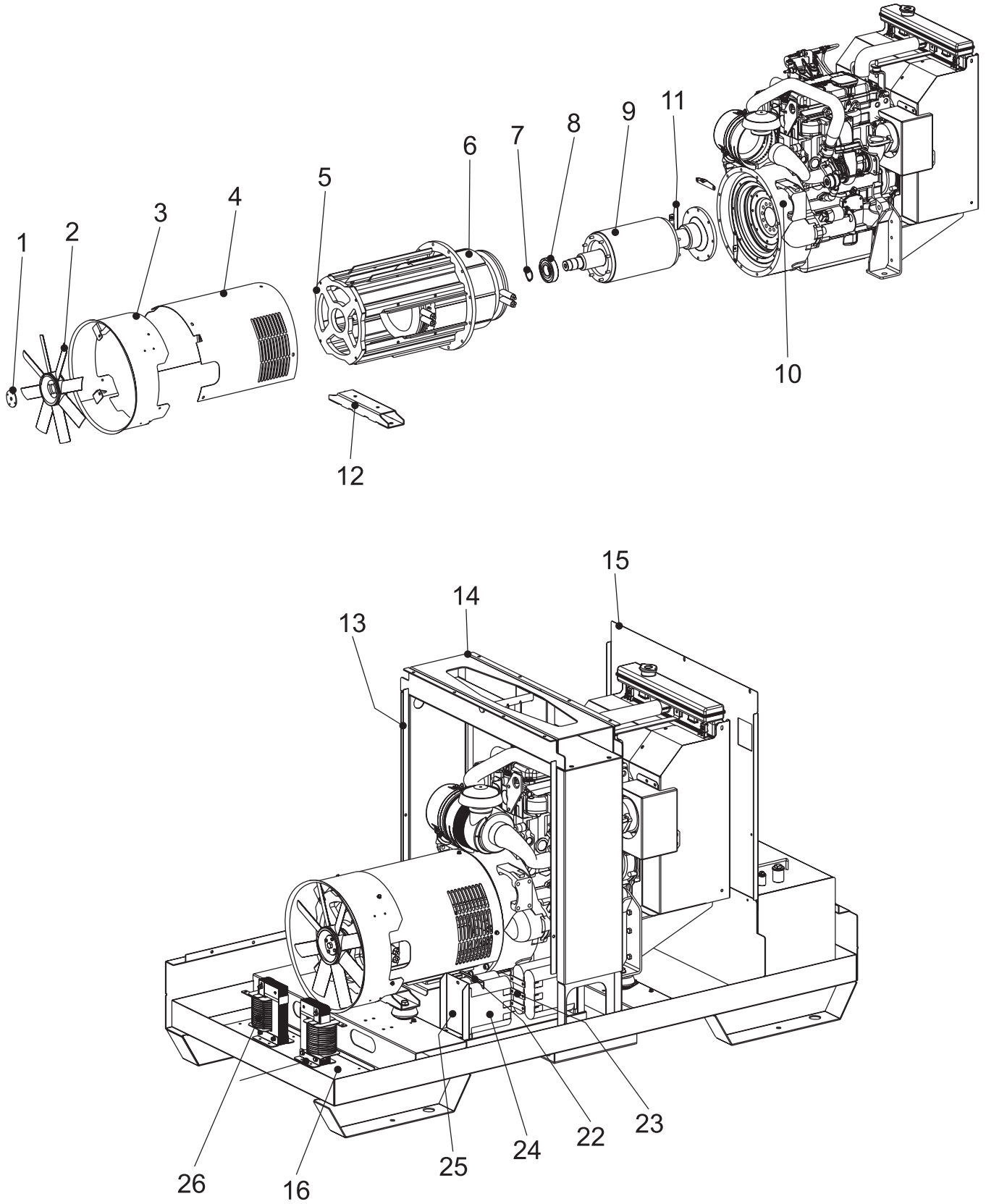
MOSA V.le Europa, 59 - 20090 CUSAGO (MI) ITALY
Tel. +39-02 90352.1 - fax +39-02 90390466

TS 0000 GE
SERIAL N° 0987654321



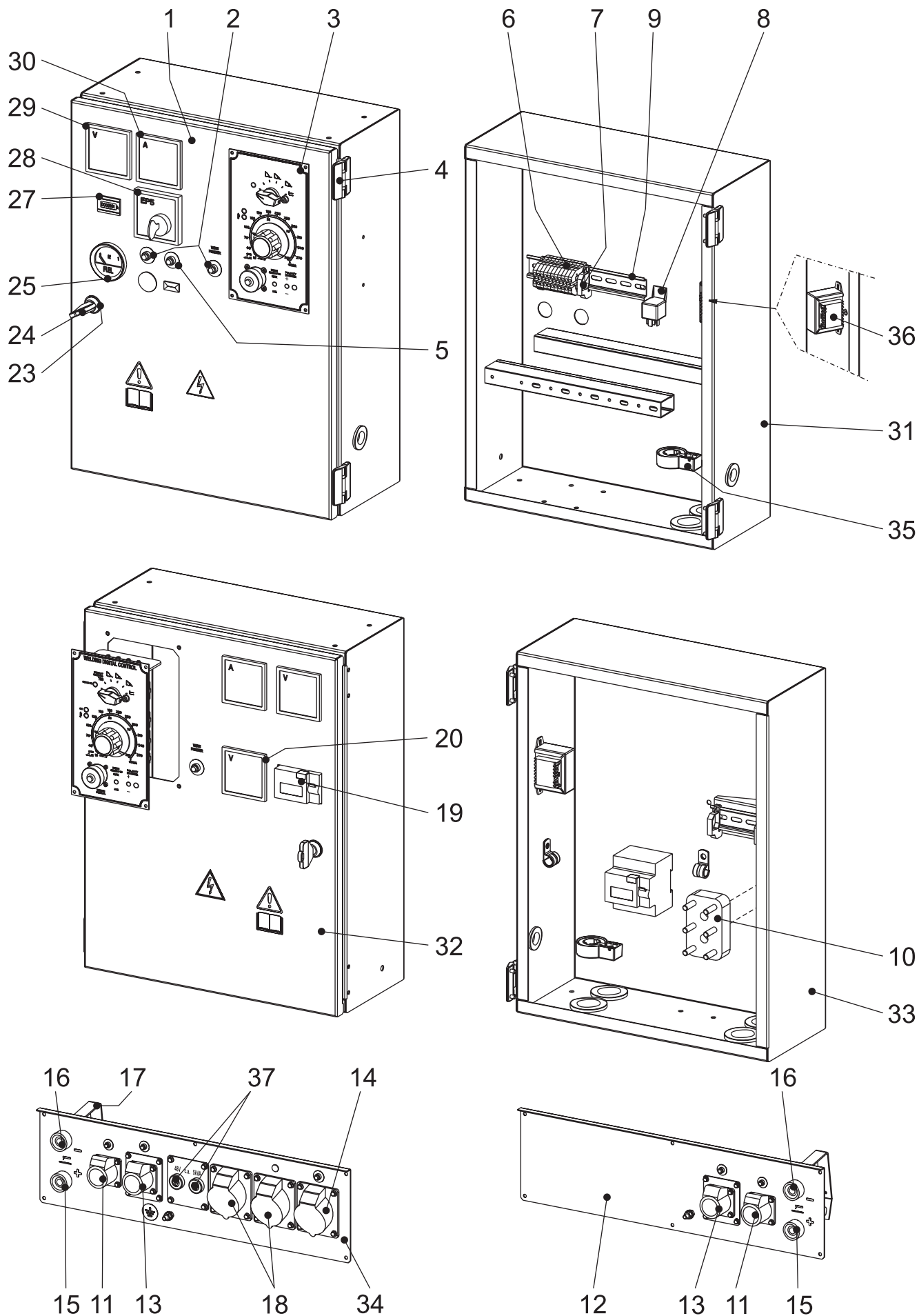
ABBREVIATIONS AND SYMBOLS:

- (EV) When ordering, specify the engine type and the auxiliary voltage
 (ER) Engine with recoil starter only
 (ES) Engine with electric starter only
 (VE) E.A.S version only.
 (QM) When ordering, specify the length in meters
 (VS) Special version only
 (SR) By request only



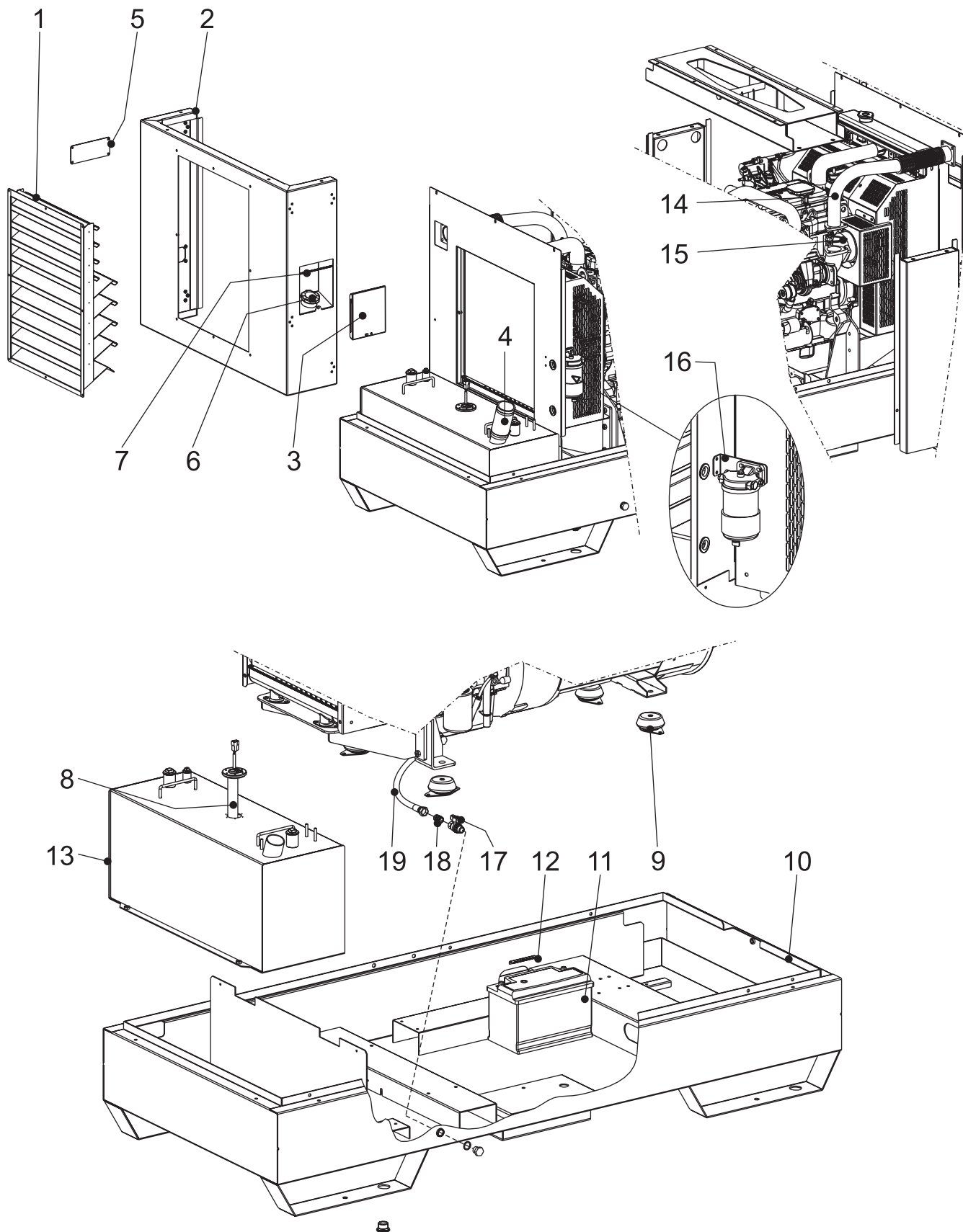
Pos.	Rev.	Cod.	Descr.	Note
1		M107301390	ANELLO	
2		M107601470	VENTOLA COMPLETA	
3		M308306010	CONVOGLIATORE ARIA ALTERNATORE	
4		M784008222	COPERTURA ALTERNATORE	
5		M766703010	CARCASSA PER STATORE	
6		M784003020	STATORE	
7		M6050050	ANELLO SEEGER	
8		M1001050	CUSCINETTO	
9		M766703030	ALBERO CON ROTORE (COMPLETO)	
10		M740552200	MOTORE PERKINS 1103A-33TG1	Fino a REV.04/08 Del.5/08-16/01/08
10		M840562200	MOTORE PERKINS 1103C-33TG3	Da REV.09/08 Del.5/08-16/01/08
11		M765008224	STAFFA SUPPORTO COPERTURA ALT.	
12		M323003101	TRAVERSA ALTERNATORE (COMPL.)	Fino a REV.04/08 Del. 252/07-14/11/07
12		M884123101	TRAVERSA ALTERNATORE (COMPL.)	Da REV.04/08 Del. 252/07-14/11/07
13		M744508430	TRAVERSA UNIONE FIANCATE	
14		M744501060	TRAVERSA DI SOLLEVAMENTO	
15		M840768215	PARETE SCARICO ARIA MOTORE	
16		M784104126	LAMIERA PORTA REATTORE	
22		M209719882	STAFFA BOX CONDENSATORI	
23		M107509041	SBARRETTA BOX CONDENSATORI	
24		M307809880	BOX CONDENSATORI 3X80 UF	
25		M784109887	PIASTRA FISS.BOX COND.(COMPL.)	
26		M786104100	REATTORE DI LIVELLO	Era 282004100

Pos.	Rev.	Cod.	Descr.	Note
1		M107301390	RING FIXING FAN	
2		M107601470	FAN COMPLETE	
3		M308306010	ALTERNATOR AIR CONVEYOR	
4		M784008222	ALTERNATOR COVER	
5		M766703010	HOUSING	
6		M784003020	STATOR	
7		M6050050	RING, SEEGER	
8		M1001050	BEARING	
9		M766703030	SHAFT ROTOR (COMPL.)	
10		M740552200	ENGINE PERKINS 1103A-33TG1	Up to REV.04/08 Del.5/08-16/01/08
10		M840562200	ENGINE PERKINS 1103C-33TG3	From REV.09/08 Del.5/08-16/01/08
11		M765008224	ALTERNATOR COVER SUPPORT	
12		M323003101	ALTERNATOR BRACKET (COMPL.)	Up to REV.04/08 Del. 252/07-14/11/07
12		M884123101	ALTERNATOR BRACKET (COMPL.)	From REV.04/08 Del. 252/07-14/11/07
13		M744508430	COVERS BRACKET	
14		M744501060	BRACKET LIFT	
15		M840768215	ENGINE AIR EXHAUST SITE	
16		M784104126	REACTOR HOLDING STEEL SHEET	
22		M209719882	CAPACITOR BOX BRACKET	
23		M107509041	CONNECTING PLATE-CAPACITOR BOX	
24		M307809880	CAPACITOR BOX 3X80 UF	
25		M784109887	SUPPORT BRACKET REACTOR	
26		M786104100	CAPACITOR BOX	Was 282004100



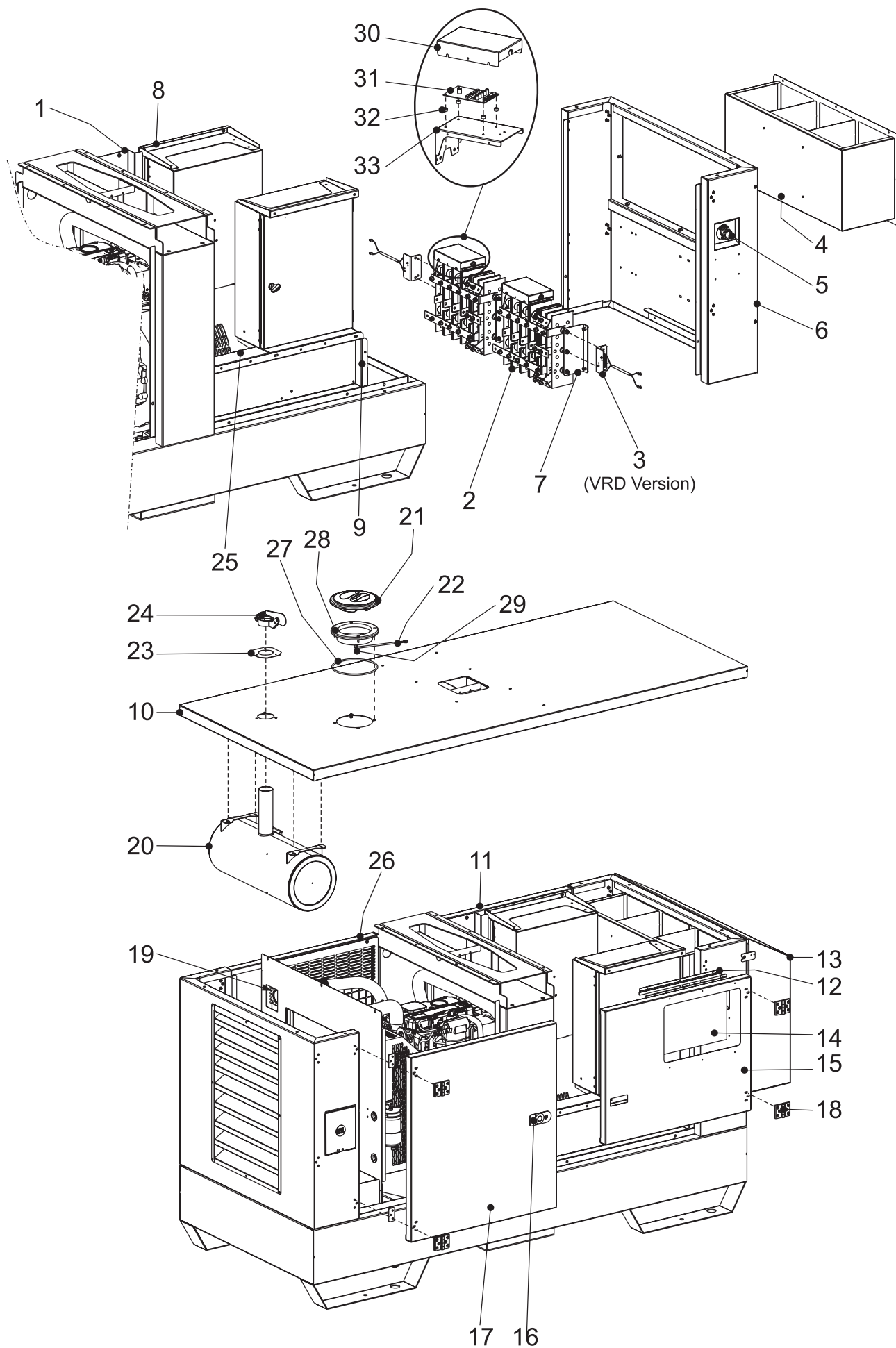
Pos. Rev.	Cod.	Descr.	Note
1	M784017080	FRONTALE LATO MOTORE	
2	M306467109	PROTEZIONE TERMICA (C.B.)	
3	M0000794057425	FRONT.CONTR.SALD.(PROGRAMMATO)(WDC 400)	Fino a REV.0-09/06 Del.193/06-13/11/06
3	M884127425	FRONT.CONTR.SALD.(PROGRAMMATO)(WDC 400)	Da REV.1-11/06 Del 193/06-13/11/06
4	M744508103	CERNIERA X COPERCHIO FRONTALE	
5	M873407107	DISGIUNTORE TERMICO 30A/250V	
6	M1240020	MORSETTO 4mmq	
7	M1241010	PIASTRINA	
8	M306479199	RELE' AVV. ELETTRICO	
9	M1243020	GUIDA PER MORSETTIERA	
10	M105111830	MORSETTIERA	
11	M218137280	PRESA CEE 48V 32A	
12	M884027085	PANNELLO PORTA PRESE LATO SALD.	
13	M307017240	PRESA 220V 16A	
14	M105111520	PRESA CEE 220V MONOF. 2P+T	
15	M102301310	PRESA DI SALDATURA (+)	
16	M102044400	PRESA DI SALDATURA (-)	
17	M107509890	SHUNT DI MISURA	
18	M105111510	PRESA CEE 380V TRIFASE	
19	M305027105	INTERRUTTORE DIFFERENZIALE	
20	M305717300	VOLTMETRO	
23	M744508112	SERRATURA PER COPERCHIO FRONT.	
24	M744507057	CHIAVE SERRATURA QUADRO Elett.	
25	M325507210	INDICATORE LIVELLO CARBURANTE	
27	M105511810	CONTAORE 230V 50Hz IP65	
28	M744509770	UNITA'CONTROLLO MOTORE	
29	M765007300	VOLTMETRO DI SALD.100V F.S. DC	
30	M765007305	AMPEROMETRO DI SALD.600A/90mV	
31	M784007010	SCATOLA ELETTRICA LATO MOTORE	
32	M784017020	FRONTALE LATO GENERAZIONE	
33	M784007090	SCATOLA Elett. LATO GENERAZ.	
34	M884027065	PANNELLO PORTA PRESE	
35	M282005107	SENSORE DI HALL 400A	
36	M282009869	TRASFORMATORE	
37	M101131220	PRESA DINSE	

Pos. Rev.	Cod.	Descr.	Note
1	M784017080	ENGINE SIDE FRONT PANEL	
2	M306467109	THERMOPROTECTION (B.C.)	
3	M0000794057425	WDC FRONT	Up to REV.0-09/06 Del.193/06-13/11/06
3	M884127425	WDC FRONT	From REV.1-11/06 Del 193/06-13/11/06
4	M744508103	LATCH X FRONT COVER	
5	M873407107	CIRCUIT BREAKER 30A/250V	
6	M1240020	TERMINAL 4mmq	
7	M1241010	PLATE	
8	M306479199	RELAY, ELECTRIC START	
9	M1243020	TERMINAL GUIDE	
10	M105111830	TERMINAL BOARD	
11	M218137280	EEC SOCKET 48V 32A	
12	M884027085	SOCKET HOLDER PANEL, WELDING SIDE	
13	M307017240	EEC SOCKET 16A, 220V 2P+T	
14	M105111520	EEC SOCKET SINGLE-PH.220V 2P+T	
15	M102301310	WELDING SOCKET (+)	
16	M102044400	WELDING SOCKET (-)	
17	M107509890	SHUNT	
18	M105111510	EEC SOCKET THREE-PHASE 380V	
19	M305027105	GROUNDFAULT INTERRUPTOR (GFI)	
20	M305717300	VOLTMETER	
23	M744508112	FRONT COVER LOCK	
24	M744507057	ELECTRICAL BOARD KEY	
25	M325507210	FUEL LEVEL GAUGE	
27	M105511810	HOURMETER 230V 50Hz IP65	
28	M744509770	PCB ENGINE CONTROL EP5	
29	M765007300	WELDING VOLTMETER 100V, DC RANGE BOTTOM	
30	M765007305	WELDING AMMETER 600 A/90mV	
31	M784007010	ELECTRICAL BOX ENGINE SIDE	
32	M784017020	FRONT PANEL GENERATION SIDE	
33	M784007090	ELECTRICAL BOX GENERATION SIDE	
34	M884027065	SOCKETS HOLDER FRONT PANEL	
35	M282005107	HALL SENSOR	
36	M282009869	TRANSFORMER	
37	M101131220	SOCKET	



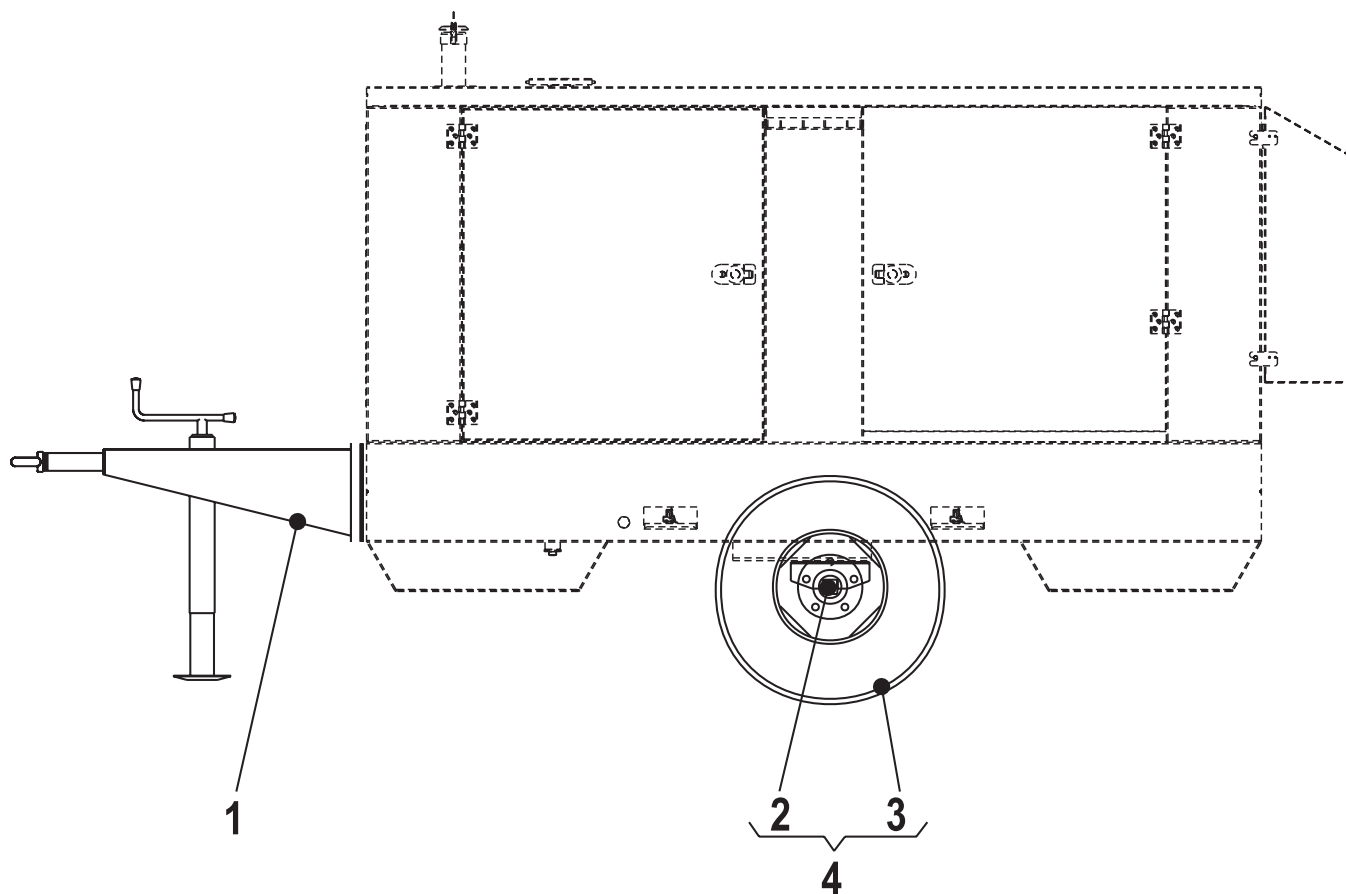
Pos.	Rev.	Cod.	Descr.	Note
1		M766708065	GRIGLIA PER CARENATURA	
2		M766708035	CARENATURA POSTERIORE	
3		M744501255	COPERCHIO VANO RIFORNIMENTO	
4		M6095030	TUBO GOMMA	
5		M305607032	COPERCHIO	Fino a REV.0-09/06-Del.106/09-14/10/09
5		M841657032	COPERCHIO	Da REV.1-02/11-Del.106/09-14/10/09
6		M342202026	TAPPO SERBATOIO	
7		M740558073	TIRANTE M5x175	
8		M840759975	SENSORE LIVELLO CARBURANTE (L=355)	
9		M105611550	ANTIVIBRANTE	
10		M840761050	BASAMENTO	
11		M764409150	BATTERIA	
12		M400409154	STAFFA FISSAGGIO BATTERIA	
13		M840762020	SERBATOIO CARBURANTE (capacità 102lt.)	
14		M784102070	TUBO DI SCARICO	
15		M784102069	GUARNIZIONE SCARICO MOTORE	
16		M766702241	STAFFA SUPP. FILTRO GASOLIO	
17		MJJ0062025	RUBINETTO M-F 1/2" G	
18		MJJ0062292	NIPPLO OLEODINAMICO 1/2" G	
19		M744502212	TUBO SCARICO OLIO	

Pos.	Rev.	Cod.	Descr.	Note
1		M766708065	COVER GRATE	
2		M766708035	REAR COVER	
3		M744501255	FUEL COVER	
4		M6095030	PIPE	
5		M305607032	COVER	Up to REV.0-09/06-Del.106/09-14/10/09
5		M841657032	COVER	From REV.1-02/11-Del.106/09-14/10/09
6		M342202026	CAP, FUEL TANK	
7		M740558073	TIE-ROD	
8		M840759975	FUEL LEVEL SENSOR	
9		M105611550	VIBRATION DAMPER	
10		M840761050	BASE	
11		M764409150	BATTERY	
12		M400409154	BATTERY BRACKET	
13		M840762020	FUEL TANK	
14		M784102070	EXHAUST PIPE	
15		M784102069	GASKET	
16		M766702241	SUPPORT FILTER	
17		MJJ0062025	COCK	
18		MJJ0062292	OLEODYNAMIC NIPPLE	
19		M744502212	OIL EXHAUST TUBE	



 REV.2-02/11	(I) Tavola ricambi	(D) Ersatzteile	DSP 2x400 PSX	ED 13.1
	(GB) Spare parts table	(E) Tabla de recambios		
	(F) Table pièces de rechange	(NL)		

Pos.	Cod.	Descr.	Note
1	M766707070	FIANCATA DX COPERT.SCAT.ELETTR. / <i>RIGHT SIDE ELECTRICAL BOX COVER</i>	
2	M785005400	PONTE CHOPPER / <i>CHOPPER BRIDGE</i>	Fino a/Up to Del.06/09-26/01/09
2	M784115400	PONTE CHOPPER / <i>CHOPPER BRIDGE</i>	Da/From Del.06/09-26/01/09 - Fino a/Up to Del.52/09-20/04/09
2	M784135400	PONTE CHOPPER / <i>CHOPPER BRIDGE</i>	Da/From Del.52/09-20/04/09 - Fino a/Up to REV.1-11/06 Del.118/10-27/09/10
2	M884125400	PONTE CHOPPER / <i>CHOPPER BRIDGE</i>	Da/From REV.2-02/11 Del.118/10-27/09/10
3	M78610A725	RETE R.C.(VRD)(RICAMBI) / <i>R.C. NET (VRD)</i>	Solo versione VRD / <i>Only VRD version</i>
4	M766708160	CASSONETTO INT.ASPIRAZ.(COMPL) / <i>INTAKE CASE (COMPLETE)</i>	
5	M744507219	PULSANTE STOP D'EMERGENZA / <i>EMERGENCY PUSH BUTTON STOP</i>	
6	M784008005	CARENATURA ANTERIORE (COMPL.) / <i>FRONT COVER (COMPL.)</i>	
7	M784005091	STAFFA SUPPORTO PONTE DIODI / <i>SUPPORT BRACKET DIODE BRIDGE</i>	
8	M784007102	STAFFA SUPP. SCATOLA ELETTRICA / <i>SUPPPORT BRACKET ELECTRIC BOX</i>	
9	M766707004	SCATOLA SUPP.APPARECC.ELETTR. / <i>ELECTRICAL DEVICES HOLDING BOX</i>	
10	M840768091	CARENATURA SUPERIORE / <i>TOP COVER</i>	
11	M766708426	FIANCATA LATO STRUMEN. (COMPL) / <i>INSTRUMENTS SIDE</i>	
12	M744508090	SQUADR.FISS.SCHERMO PORTELLA / <i>FIXING BRACKET DOOR SCREEN</i>	
13	M766708220	CASSONETTO ASPIRAZIONE ARIA / <i>AIR INTAKE BOX</i>	
14	M744508089	SCHERMO PER PORTELLA / <i>GLASS COVER</i>	
15	M744508426	FIANCATA LATO STRUMENTI / <i>COVER COMMANDS SIDE</i>	
16	M744508136	MANIGLIA A PULSANTE / <i>HANDLE</i>	
17	M744508428	FIANCATA INTERMEDIA / <i>MIDDLE COVER</i>	
18	M744508140	CERNIERA PER FIANCATA / <i>LATCH</i>	
19	M325252069	GUARNIZIONE / <i>GASKET</i>	
20	M840752050	SILENZIATORE DI SCARICO / <i>EXHAUST MUFFLER</i>	
21	M841658360	COPERCHIO ERMETICO / <i>RADIATOR COVER CAP</i>	Era/was 766708070
22	M841659357	TIRANTE IN GOMMA / <i>TIE-ROD</i>	Era/was 209718073
23	M766702068	FLANGIA PER TUBO SCARICO / <i>FLANGE FOR EXHAUST PIPE</i>	
24	M305012053	COPERCHIETTO / <i>CAP</i>	
25	M766707203	SCATOLA PROTEZIONE PRESE / <i>PROTECTION SOCKETS BOX</i>	
26	M840762058	PROTEZIONE TERMICA / <i>THERMAL PROTECTION</i>	
27	M1018130	ANELLO OR/ <i>OR RING</i>	
28	M841658361	GHIERA PER COPERCHIO ERMETICO / <i>FLANGE FOR AIR-TIGHT SEALED COVER</i>	
29	M841659358	ANELLO DOPPIO / <i>DOUBLE RING</i>	
30	M273119654	SCATOLA PROTEZ. SCHEDA SALDATURA / <i>BOX PROTECTION PCB WELDER</i>	
31	M785109625	SCHEDA ALIMENTAZIONE/DRIVE / <i>POWER SUPPLY PCB</i>	
32	M102302060	DISTANZIALE / <i>SPACER</i>	
33	M273119756	STAFFA SUPP. SCHEDA / <i>BRACKET PCB WELDER SUPPORT</i>	



Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		0000744500141	GR.TIMONE,PIEDE X TRAINO LENTO	KIT SITE TOW	
2		225101160	ASSALE	AXLE	
3		325501170	RUOTA	WHEEL	
4		0000225100142	GR. ASSALE, RUOTE TRAINO LENTO	KIT WHEELS AND HANDLES	